Group Award Specification for:

HNC Computer Games Development

Group Award Code: GM09 15

HND Computer Games Development

Group Award Code: GM0A 16

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Contents

1 Introduction

This document was previously known as the Arrangements document. The purpose of this document is to:

- assist centres to implement, deliver and manage the qualification
- provide a guide for new staff involved in offering the qualification
- inform course managers teaching staff, assessors, learners, employers and HEIs of the aims and purpose of the qualification
- provide details of the range of learners the qualification is suitable for and progression opportunities

Rationale for the Development of the awards

The HNC/HND Computer Games Development awards described in this document are intended to address the needs of a developing and constantly evolving games industry. The awards have been designed to provide a current and practical skill-set for learners to take forward into further study or to employment at a junior or 'intern' level in the games industry.

Background to the development of the awards

The first award within the games area of computing was an HNC devised locally in 2005. The previous HNC and HND Computer Gamed Development awards built upon the initial award and were devised to address the needs of the industry and to facilitate progression to universities offering specialist computer games courses. Those awards were validated in March 2010. Since that date there have been notable changes within the games industry.

A review of the HNC/HND Computer Games Development awards began in November 2014 with a scoping exercise to determine the necessity for any changes or updates. All of the centres delivering the awards (G9NX 15 and G9NY16) were consulted and the general consensus was that the awards remained highly relevant, popular, and still met their aims but that minor updates and additions were required. The first Qualification Development Team meeting for review of the awards was held in May 2015.

The market for mobile gaming has changed in line with technology to offer gaming on devices over many platforms. This has now become the most popular way to access and play games. Employment in the games industry also continues to grow with many more, small independent companies developing successful mobile games and applications. Consequently, the revisions to these awards include the development of knowledge and skills in this area. The UK is also one of the strongest markets in the world for cloud computing and data management; this, accompanied by developments in web technologies, has also increased the number of ways games that can be accessed, developed, and stored, hence knowledge of this is essential to the provision of a robust award for the future.

These revised awards incorporate the successful and current elements from their predecessors whilst introducing new options that reflect the rapidly changing nature of the sector.

Titles of the awards

The titles of the awards are HNC Computer Games Development and HND Computer Games Development. This accurately reflects the focus of the awards and identifies them as a specialist computing topic.

The titles also:

- provide continuity with the National courses at SCQF Levels 5 and 6 of the same title.
- accurately describe the essential content of the awards.
- distinguish the awards from the other HN Computing awards.
- reflect the substance of possible employment positions within the industry.
- are indicative of similar course titles in higher education.

Target client groups

The qualifications are aimed at:

- School leavers with passes in two relevant National Courses at SCQF level 6 (Higher) together with three relevant subjects at National 5.
- Those who wish to progress from relevant National courses at SCQF level 6 such as National Certification in Computing with Digital Media or National Progression Award in Computer Games Development.
- Adult returners who are already working in this field and may have developed small independent games but who wish to gain nationally recognised qualifications.
- Those who wish to progress to university level Games Programming or Production Management courses.
- Those who wish to work as games programmers.
- Those who wish work within the games industry as assistant production managers, user interface analysts or interaction engineers.

Employment opportunities

These awards aim to develop employment skills, enhance employment prospects and begin the process of ongoing professional development. Therefore, the awards must provide a skill set that matches those required by the computer games and digital industries. It proposes to achieve this by engagement with National Occupational Standard (NOS).

IT Professional Standards and Creative Skillset are the NOS relevant to these qualifications. IT User Skills Standards (National Occupational Standards) are industry standards for skills developed in collaboration with employers, professional bodies and others. The awards have been developed to make sure that they address specific areas of competence needed by IT users in the games and digital industries. The areas of relevance for these awards are Digital Content and Digital Applications.

The standards from IT Professional Standards that apply to these qualifications fall under the categories Architecture, Analysis and Design and Solution Development and Implementation. Further information can be found here:

https://www.thetechpartnership.com/standards-and-quality/it-professional-standards/

Creative Skillset is the industry skills body for the Creative Industries. Interactive Media and Computer Games (2013) National Occupational Standards (NOS) are the standards that cover the main areas of competence that are at the heart of interactive media development. They are supported by other areas of competence that are not specific to this discipline but which are nevertheless of vital importance to it. Further information can be found here:

http://standards.creativeskillset.org/assets/0000/0876/Full_Suite_IMCG_Approved_Feb_201 3.pdf

A current search on the Scottish job market website s1jobs.com resulted in over 120 jobs advertised that require the skills that these awards are aimed at addressing. Job titles within Games Companies included:

- QA Tester
- Digital product Tester
- Level Designer
- Sales and Production Manager
- Programmer
- Applications Developer
- AI Software Engineer
- Mobile Developer
- Games Programmer Apprentice
- Game Designer

2 Qualifications structure

HNC Computer Games Development is made up of **12 SQA credits** (96 SCQF credit points) of which:

- 8 credits (64 SCQF credit points) are mandatory units
- at least 1 credit (8 SCQF credit points) is selected from Content selection
- any remaining credits from optional units.

HND Computer Games Development is made up of **30 SQA credits** (240 SCQF credit points), of which:

- 16 credits (128 SCQF credit points) are mandatory units
- at least 1 credit (8 SCQF credit points) is selected from Content selection
- at least 2 credits (16 SCQF credit points) selected from Systems selection
- at least 2 credits (16 SCQF credit points) from Mathematics selection (maximum of 4 credits)
- any remaining credits from optional units.

A mapping of Core Skills development opportunities is available in Section 5.3.

2.1 Structure

HNC in Computer Games Development

In order to achieve the HNC award the learner must achieve 8 mandatory SQA credits. At least one credit is required from the Content Selection with further credits (if any) selected from the optional units.

Mandatory units — a total of 8 SQA credits required

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
HH3M	34	Computer Games Development: Graded Unit 1	7	8	1
HH57	34	Computer Games: Programming Fundamentals	7	24	3
H178	34	Team working in computing	7	8	1
DH35	34	Computing: Planning	7	8	1
H17D	34	Computing: Introduction to Project Management	7	8	1
HH3F	34	Game Technology	7	8	1

Content selection — a minimum of 1 SQA credit required

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
F869	34	3D Level editing	7	8	1
HH37	34	Game Interface Design	7	8	1
HH38	34	2D Animation for Games	7	8	1
HH39	34	Computer Games: Creating Graphics	7	8	1

Optional units — any remaining credits will be selected from this list

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
H17W	34	Software Development: Developing Small Scale Standalone Applications	7	16	2
DE2N	35	3D Modeling and Animation	8	16	2
HH3D	35	Artificial Intelligence for Computer Games	8	16	2
DV5T	34	Art and Design: Creative Process	7	8	1
HF3F	34	Digital Graphics Fundamentals	7	8	1
DH34	35	Software Development: Event Driven Programming	8	16	2
HH3E	35	Game Customisation and Scripting	8	16	2
F8R6	34	Game Design Theory	7	8	1
F86H	35	Game Physics	8	8	2
HH3G	34	Games Design: Pitch a Treatment	7	8	1
F8R5	34	Games Development: Character Creation and Storytelling	7	8	1
F86A	35	Games Development: Object Oriented Programming	8	24	3
F86J	34	History, Evolution and Impact of Computer Games	7	8	1
H9DE	34	Digital Skills	7	8	1
F6BX	35	Narrative and Genre in Computer Games	8	16	2
HG1K	34	Professional Development in the Computer Industry	7	8	1
D76L	35	Software Development: Abstract Data Structures	8	24	3
DM3F	35	Software Development: Rapid Applications Development and Prototyping	8	16	2
H1J9	35	Software Development: Developing Websites for Multiplatform Use	8	16	2
H8T2	33	Workplace Communication in English	6	8	1
DE2X	35	Interactive Fiction	8	16	2
H171	35	Software Development: Object Orientated Programming	8	16	2
H173	34	Developing Software: Introduction	7	8	1
H17R	35	Mobile Technology	8	8	1
F209	34	2D Animation	7	16	2
HF55	34	User Interface Design	7	8	1
H1F7	34	Professionalism and Ethics in Computing	7	8	1

Optional units (cont)

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
DR0T	35	Entrepreneurship in the Digital Industries	8	8	1
HF51	34	Digital Media: Video	7	8	1
HF50	34	Digital Media: Audio	7	8	1
HF4Y	34	Developing Mobile Web Based Applications: An Introduction	7	8	1
HH3A	35	Computer Games: Interaction Design	8	8	1
H179	34	Cloud computing	7	8	1
HF3D	35	Designing and developing an interactive product	8	16	2
HH3H	34	Computer Programming: Applied Mathematics	7	8	1
HH3L	35	Computer Programming: Applied Mathematics	8	8	1
HH3C	35	Programming a game for a mobile device	8	8	1
F6JJ	34	Building an e-business	7	8	1
H175	34	Computer Systems Fundamentals	7	8	1
HF85	34	Emerging technologies and experiences	7	8	1

HND in Computer Games Development

In order to achieve the HND award the learner must achieve 16 mandatory SQA credits, plus at least one credit from the Content Selection, at least one credit from Systems Selection, at least two credits from Mathematics Selection (up to a maximum of four credits) and any further credits from the optional section.

Mandatory units — a total of 16 SQA credits required

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
HH3M	34	Computer Games Development Graded Unit 1	7	8	1
HH37	34	Computer Games: Programming Fundamentals	7	24	3
H178	34	Team working in computing	7	8	1
DH35	34	Computing: Planning	7	8	1
H17D	34	Computing: Introduction to Project Management	7	8	1
HH3F	34	Game Technology	7	8	1
HH58	35	Creating a Showreel and Portfolio	8	8	1
DE2N	35	3D Modelling and animation	8	16	2
F86A	35	Games Development: Object Oriented Programming	8	24	3
HH3N	35	Computer Games Development: Graded Unit 2	8	16	2

Content selection — a minimum of 1 SQA credit required

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
F869	34	3D Level editing	7	8	1
HH37	34	Game Interface Design	7	8	1
HH38	34	2D Animation for Games	7	8	1
HH39	34	Computer Games: Creating Graphics	7	8	1

Systems selection — a minimum of 2 SQA credit required

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
HF3D	35	Designing and Developing an Interactive Product	8	16	2
HH3D	35	Artificial Intelligence for Computer Games	8	16	2
F86H	35	Game Physics	8	16	2
HH3E	35	Game Customisation and Scripting	8	16	2

Mathematics selection — a minimum of 2 SQA credits required with a maximum of 4 SQA credits from this section

4 code	2code	Unit title	SCQF level	SCQF credit points	SQA credit
HH3H	34	Computer Programming: Applied Mathematics	7	8	1
HH3L	35	Computer Programming: Applied Mathematics	8	8	1
D76F	35	Mathematics for Computing 2	8	8	1
DP8F	34	Mathematics: Calculus and matrices for computing	7	8	1
F20B	34	Mathematics for Interactive Computing: Essential Techniques	7	8	1

Optional units — any remaining credits will be selected from this list

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
H17W	34	Software Development: Developing Small Scale Standalone Applications	7	16	2
DV5T	34	Art and Design: Creative Process	7	8	1
HF3F	34	Digital Graphics Fundamentals	7	8	1
DH34	35	Software Development: Event Driven Programming	8	16	2
HH3E	35	Game Customisation and Scripting	8	16	2
F8R6	34	Game Design Theory	7	8	1
F86H	35	Game Physics	8	8	2
HH3G	34	Games Design: Pitch a Treatment	7	8	1
F8R5	34	Games Development: Character Creation and Storytelling	7	8	1
F86J	34	History, Evolution and Impact of Computer Games	7	8	1
H9DE	34	Digital Skills	7	8	1
F6BX	35	Narrative and Genre in Computer Games	8	16	2
HG1K	34	Professional Development in the Computer Industry	7	8	1
D76L	35	Software Development: Abstract Data Structures	8	24	3
DM3F	35	Software Development: Rapid Applications Development and Prototyping	8	16	2
H1J9	35	Software Development: Developing Websites for Multiplatform Use	8	16	2
H8T2	33	Workplace Communication in English	6	8	1
DE2X	35	Interactive Fiction	8	16	2
H171	35	Software Development: Object Orientated Programming	8	16	2
H173	34	Developing Software: Introduction	7	8	1
H17R	35	Mobile Technology	8	8	1
F209	34	2D Animation	7	16	2

Optional units (cont)

4 code	2 code	Unit title	SCQF level	SCQF credit points	SQA credit
HF55	34	User Interface Design	7	8	1
H1F7	34	Professionalism and Ethics in Computing	7	8	1
DR0T	35	Entrepreneurship in the Digital Industries	8	8	1
HF51	34	Digital Media: Video	7	8	1
HF50	34	Digital Media: Audio	7	8	1
HF4Y	34	Developing Mobile Web Based Applications: An Introduction	7	8	1
HH3A	35	Computer Games: Interaction Design	8	8	1
HH3C	35	Programming a Game for a Mobile Device	8	8	1
H179	34	Cloud Computing	7	8	1
F6JJ	34	Building an e-business	7	8	1
H175	34	Computer Systems Fundamentals	7	8	1
HF85	34	Emerging technologies and experiences	7	8	1

Building units for HNC

The mandatory units of the award reflect its aims and purposes and are the main building blocks of the award. The content options provide subject specific learning in important areas such as game interface design, animation and graphics. *Graded Unit 1* is a teamwork project the purpose of which is to consolidate learning.

Computing: Planning

This unit is key to many of the generic aims and specific aims, the ability to understand the techniques and theory behind proper planning is necessary to produce employable learners. The unit introduces the learner to development models, writing requirements and structured English to assist in the planning for programming units. It is usually integrated with the delivery of other units.

Computer Games: Programming fundamentals

Promoting technical skills to meet elements of the specific aims, this unit provides the qualification with a strong sense of identity as a software development award. It provides the learners with an opportunity to program in a high level language and introduces them to an object oriented approach which will be built upon at HND in the object oriented programming unit.

Game Technology

This highly technical knowledge directly addresses the specific aims of this qualification. It provides relevant preparation for employment, vocational skills and also study and research skills. The unit introduces the learner to number systems, gaming hardware architecture and provides an opportunity to research current and developing technologies.

Team Working in Computing

This unit is designed to provide learners with the experience of working in a team to negotiate goals, roles and responsibilities, support co-operative working and present agreed project Outcomes within the timescale prescribed by the team. It has been included as a mandatory unit as it directly addresses some specific aims of the awards, eg interpersonal skills, collaboration, development of transferable skills and many other aims of the award.

Computing: Introduction to Project Management

This unit complements the team working unit and promotes organisational skills. It forms a basis for learning for the future at all levels of education and into employment. The unit will be a valuable asset to the team work project for *Graded Unit 1* and will help with the planning and management involved in the *Graded Unit 2*, individual project work.

Content options

With new subject-specific content options such as 2D Animation for Games and the Game Graphics units, as well as Game Interface design, the awards are relevant to the learner and add essential units which address the aims of the awards.

Building units for HND

3D Modelling and Animation

This unit is contained within the mandatory section of the HND Computer Games Development Award. It provides strong technical skills to meet elements of each of the specific aims as well as all of the general aims. Knowledge of 3D modelling is particularly useful for future employment in small independent companies where it would be useful for the employee to multi-task into areas other than coding.

Games Development: Object Oriented Programming

This unit provides technical skills to meet elements of the specific aims, as well as giving the qualification a strong sense of identity as a software development award. This unit will build on the learning needed for progression to many higher education courses.

Creating a Showreel and Portfolio

This unit addresses the additional specific aims of the HND. It enables the learner to prepare for interviews and possible employment. A portfolio and showreel of the learner's best work is created to demonstrate to a prospective employer or to a client.

Systems selection unit choices

Credits chosen by centres within this content selection group are those which will address the aims of the award in supporting learners' professional development and better prepare them for future employment. Centres can choose which options best suit the ethos of their awards.

Mathematics selection unit choices

Mathematics is a skill essential to games programming; the choice of units available within these awards aim to provide the learner with the skills to use maths as part of games programming. Learners must achieve 2 maths credits in order to obtain the HND. Although maths is no longer mandatory in HNC, centres may wish to offer it at this level in order to facilitate progression to HND or higher education courses. A variety of units can be selected and centres should choose those suited best to their university articulation agreements

3 Aims of the Group Awards

3.1 General aims of the Group Awards

The general aims are:

1 To develop learners' knowledge and skills in analysis and planning, designing and developing, reflecting and evaluating.
2 To develop employment skills and enhancement of learners' employment prospects and professional development.
3 To facilitate progression within the Scottish Credit and Qualifications Framework.
4 To develop and support study, research, and interpersonal skills.
5 To develop strategies for learning and encourage transferable skills (including Core Skills).
6 To provide academic stimulus and challenge, and nurturing of an enjoyment of the subject.

3.2 Specific aims of the Group Awards

The specific aims of **HNC** are:

7 To prepare learners for employment as a tester, level designer or intern within the computer games industry or a junior software developer role within the IT industry generally.
8 To provide a flexible and relevant curriculum to allow diverse occupational destinations within the creative and digital industries.
9 To prepare learners for progression to further study in computer games development or a related discipline.
10 To develop learners ability to work collaboratively on interactive media projects.
11 To develop an awareness of current professional practices and technologies relevant to the computer games industry.

The aims of the HND are those listed above with additional specific aims as follows:

12 To enhance employability through engagement with National Occupational Standards.
13 To develop a range of specialist knowledge and skills that reflects recent, in-demand skills in multiplatform applications development.
14 To develop an awareness of the preparation required to optimise future employment opportunities.
15 To develop an awareness of entrepreneurship and the requirements for establishing a client base for independent work.
16 To encourage professional development and the ongoing need to update skills in line with technological advancements.

3.3 Graded Units

HNC Computer Games Development: Graded Unit 1

Teamwork Project — 1 credit

This unit is designed to provide evidence that the learner has consolidated their knowledge and skills relating to planning, analysing, implementing and evaluating within a teamwork environment. It encourages learners to develop study, research, and interpersonal skills and prepares them for progression to further study. The Evidence Requirements of this unit encompass all of the general and specific aims of the award. The provision of a teamwork Graded Unit is viewed as a strength for this award and more closely simulates a workplace experience. Peer evaluation and assessment is included in the marking scheme of this unit.

HND Computer Games Development: Graded Unit 2

Individual Project — 2 credits

This unit provides learners with the opportunity to enhance their skills and combine their knowledge from units within the award framework. This is achieved by undertaking an individual project to produce an interactive game suitable for inclusion in a portfolio demonstrating ability. All of the general aims and specific aims for HND are evidenced in this unit.

4 Recommended entry to the qualifications

Entry to the qualifications is at the discretion of the centre. The following information on prior knowledge, skills, experience or qualifications that provide suitable preparation for this qualification has been provided by the Qualification Design Team as guidance only.

For entry to the Higher National Certificate, learners would benefit from having attained the skills, knowledge and understanding required by one or more of the following or equivalent qualifications and/or experience:

- Passes in two relevant subjects at SCQF level 6 (Higher), one of which should be Maths, Computing, or Physics together with at least three relevant subjects at National 5, one of which must be English.
- Relevant work experience which has involved a significant amount of coding in a high level language.
- A related National Certificate at SCQF level 6 to include Mathematical units, Problem solving, English and Numeracy skills.

- A National Progression Award (NPA) at SCQF level 5 or 6 in Games Development or Digital Media together with one other subject at SCQF level 6 (Higher) and Maths and English at National 5.

For entry to the Higher National Diploma learners should attain 15 credits including all of the mandatory units for the HNC.

4.1 Core Skills entry profile

The Core Skill entry profile provides a summary of the associated assessment activities that exemplify why a particular level has been recommended for this qualification. The information should be used to identify if additional learning support needs to be put in place for learners whose Core Skills profile is below the recommended entry level or whether learners should be encouraged to do an alternative level or learning programme. A detailed outline of the Core Skills development opportunities is provided in Section 5. 3.

To begin the HNC and have the likelihood of successfully completing this qualification the learner should ideally have an entry level of SCQF level 5 in the Core Skills as listed in the table below. A range of assessment activities are listed which exemplify the need for this and will develop the learners' Core Skill profile to SCQF level 6 before beginning the HND award.

Core Skill	Recommended SCQF entry profile	Associated assessment activities
Communication	SCQF level 5 for HNC SCQF level 6 for HND	Report and essay writing exemplified in the unit *Game Design Theory*. Presenting information as a pitch exemplified in the unit *Pitch a Treatment*. Collaborating with peers as part of a team. Keeping log books, blogs or video diaries of progress. These are exemplified in *Graded Unit 1* and *Team Working in computing*.
Numeracy	SCQF level 4 for HNC SCQF level 5 for HND	Logical operations, basic mathematical operations. These are used in mathematical and programming units in these awards.
Information and Communication Technology (ICT)	SCQF level 5 for HNC SCQF level 6 for HND	Use technology to research and present information. Use software tools to manipulate graphics. Use software development environments to create code. These can all be exemplified in programming, animation and digital editing units of these awards.

Core Skill	Recommended SCQF entry profile	Associated assessment activities
Problem Solving	SCQF level 5 for HNC SCQF level 6 for HND	Skills in analysis, research Time management Risk assessment These can be exemplified in the Graded Units, mathematical units and team working units in these awards.
Working with Others	SCQF level 5 for HNC SCQF level 6 for HND	Contributing to team work, sharing and organising information together, planning a teamwork schedule. These can be exemplified in the Graded Units and team working units in these awards.

4.2 Computational Thinking Skills within the awards

Computational thinking is the combination of thinking skills and computing skills. It involves thinking like a computer scientist. In short, it is about analysing a problem, reasoning or evaluating possible solutions, determining the most efficient computer-based solution, designing a solution using algorithms and data structures, creating (coding) the solution, testing solutions, and evaluating the final program. Thus, computational thinking can be said to involve the identification of computer-based solutions to solve everyday problems. The table below identifies some of the activities and units within this award where computational thinking would be used.

Computational Thinking	Associated assessment activities
Analytical Skills	Report and essay writing exemplified in the unit Game Design Theory. Planning and creating code and writing pseudocode evident in units like the Computing planning unit and subsequent programming units at levels 7 and 8. The consolidation of learning in the Graded Units also demonstrates skills in analysis.
Reasoning Skills	Logical operations, basic mathematical operations. These are used in mathematical and programming units in these awards.
Designing solutions	Use of software tools to create and manipulate graphics. Use software development environments to create code. These can all be exemplified in programming, animation and digital editing units of these awards.

Computational Thinking	Associated assessment activities
Creating a solution	Coding a program, designing an interface These can be exemplified in the programming, interface, interaction design units and in the Graded Units, mathematical units and team working units in these awards.
Testing and Evaluating	Testing code, making comparisons, user testing, iterative design. These can be exemplified in programming, design and mathematical, Graded Units and team working units in these awards.

5 Additional benefits of the qualification in meeting employer needs

The qualifications were designed to meet a specific purpose and what follows are details on how that purpose has been met through mapping of the units to the aims of the qualifications. Through meeting the aims, additional value has been achieved by linking the unit standards with those defined in National Occupational Standards and/or trade/professional body requirements. In addition, significant opportunities exist for learners to develop the more generic skill, known as Core Skills through doing the qualifications.

A major feature and benefit of the awards and one which is strongly reflected in the survey is the emphasis on team work, in particular *Graded Unit 1*. Working as a member of a team is a useful experience for learners since they will be working in teams when employed in the games industry. Although *Graded Unit 2* in the HND has remained an individual project, there can be opportunities for team work in other units such as *Designing and Developing an Interactive Product*.

Another beneficial feature of the awards is the mathematical content where to successfully complete the HND learners require 2 credits in mathematics. This is a pre-requisite for many Higher Education courses and is also a valuable component to assist in programming and technical aspects of work that they could undertake in future employment.

Computer games development requires a unique and varied set of skills. Increasingly, with the development of mobile gaming, many smaller independent companies require abilities in more than one area, for example it is beneficial if programmers can also create and manipulate graphics and have an awareness of usability issues. Equally designers know and understand some of the coding and technical problems that can arise. Therefore, the awards try to encompass a multi-disciplinary approach where a combination of specialist skills drawn from the programming or technical aspects; the creative and design aspects; and the business and production management aspects, are all covered during the course of delivery of these awards.

Specialist transferable skills are also needed; these may include for example, knowledge of the use of particular software packages, mobile platforms, and other technologies. More general transferable skills include the ability to communicate and present information, collaborate, research, study and make use of ICT. An awareness of the industry, its many and varied products, and current trends is also important. These awards aim to encourage learners to acquire all of this skillset and to become valuable employees within the games industry when their education is completed.

'Practitioners are expected to have certain attitudes relating in particular to skills acquisition and working practices. Successful practitioners need to be flexible, adaptable, self-motivated and autonomous, with an entrepreneurial attitude and a willingness to continue learning. They must have a broad outlook and be willing to embrace hybrid skills and cross-disciplinary roles.'

(Creative Skillset Interactive Media and Computer Games NOS, Approved February 2013)

To prepare learners for employment opportunities, a new unit focusing on developing a showreel and portfolio to showcase the learner's best work has been included as mandatory within the HND. Feedback from employers has indicated that most job applicants are required to demonstrate their work at or prior to interview. Encouraging the learner to develop the skills to do this within the award was thought to be essential even if they are progressing to university first and not immediately seeking employment.

5.1 Mapping of qualification aims to units

The following table maps the general and specific aims of the qualifications, listed below, to the mandatory units and required selected content areas contained within the award.

Code	Unit title	Aims															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
HH3M 34	Computer Games Development Graded Unit 1	√	√	√	√	√	√	√	√	√	√	√					
HH57 34	Computer Games: Programming Fundamentals	√	√	√	√	√	√	√	√	√	√	√	√	√			
H178 34	Team Working in Computing		√	√	√	√			√	√	√	√	√	√		√	
DH35 34	Computing Planning	√	√	√	√	√	√	√	√	√		√	√	√			
H17D 34	Computing: Introduction to Project Management	√	√	√	√	√	√		√	√	√	√	√	√	√	√	
HH3F 34	Game Technology			√		√	√			√		√	√	√			√
DE2N 35	3D Modelling and animation		√	√	√		√			√		√	√	v			
F86A 35	Games Development: Object Oriented Programming	√	√	√	√	√	√	√	√	√		√	√	√			
HH3N 35	Computer Games Development: Graded Unit 2	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
F869 34	3D Level editing			√	√		√		√	√		√	√				
HH37 34	Game Interface Design	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
HH38 34	2D Animation for Games		√	√	√	√	√		√	√		√	√	√			
HH39 34	Computer Games: Creating Graphics	√	√	√	√	√	√	√	√	√		√	√	√			
HF3D 35	Designing and Developing an Interactive Product	√	√	√	v	√	v	√	√	√	√	√	√	√	√	√	√
HH3D 35	Artificial Intelligence for Computer Games	√	√	√	√	√	√	√	√	√		√	√				√
F86H 35	Game Physics	√	√	√		√	√	√		√		√	√				
HH3E 35	Game Customisation and Scripting	√	√	√		√	√			√		√	√	√	√	√	
HH58 35	Creating a Showreel and Portfolio	√	√	√	√	√	√		√			√			√	√	√

5.2 Mapping of National Occupational Standards (NOS) and/or trade body standards

The primary source of relevant National Occupational Standards for the HNC/HND Computer Games Development comes from the *National Occupational Standards: Interactive Media* published by *Skillset, the Sector Skills Council for Creative Media* (Feb 2013).

The standards cover the main areas of competence that are at the heart of computer games and interactive media development. They are supported by other areas of competence that are not specific to this discipline but which are nevertheless of vital importance to it. IM1-The Work Effectively in Interactive Media and Computer Games standard is intended to be a foundation for all the other standards.

The standards include:

IM1	Work Effectively In Interactive Media and Computer Games	IM15	Create Art for Electronic Games
IM2	Initiate Interactive Media Projects	IM16	Create Sound Effects for Interactive Media Products
IM3	Provide Creative and Strategic Direction For Interactive Media Projects	IM17	Create Music for Interactive Media Products
IM4	Create Narrative Scripts for Interactive Media Products	IM18	Use Authoring Tools to Create Interactive Media Products
IM5	Design Interactive Media Products	IM19	Use Mark-Up in Interactive Media Products
IM6	Design Electronic Games	IM20	Optimise Web Pages for Search Engines
IM7	Design User Interfaces for Interactive Media Products	IM21	Use Style Sheets in Interactive Media Products
IM13	Direct Asset Production for Interactive Media Products	IM22	Use Scripting Languages in Interactive Media Products
IM14	Create Animated Assets for Interactive Media Products	IM23	Use Programming Languages in Interactive Media Products
IM8	Determine the Implementation of Designs for Interactive Media Products	IM24	Devise and Evaluate User Testing of Interactive Media Products
IM9	Plan Content for Interactive Media Products	IM25	Conduct User Testing of Interactive Media Products
IM10	Write and Edit Copy for Interactive Media Products	IM26	Test Electronic Games
IM11	Obtain Assets for Use in Interactive Media Products	IM27	Analyse Data in Interactive Media and Computer
IM12	Prepare Assets for Use in Interactive Media Products	IM28	Manage Intellectual Property Rights
		IM29	Manage Online Engagement

The following table summarises the relevant standards that have influenced the design of the HNC/HND Computer Games Development, in relation to the mandatory units and required selected content areas contained within the award.

Code	Unit title	National Occupational Standard (IM)																		
		1	2	3	5	6	7	8	9	11	12	14	15	16	23	24	25	26	27	28
HH3M 34	Computer Games Development: Graded Unit 1	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
HH57 34	Computer Games: Programming Fundamentals	√			√	√									√	√	√	√	√	√
H178 34	Team working in computing	√	√	√					√											√
DH35 34	Computing Planning		√	√					√						√					
HI7D 34	Computing: Introduction to Project Management	√	√	√					√											√
HH3F 34	Game Technology	√																	√	
DE2N 35	3D Modelling and animation				√		√			√	√	√	√	√						√
F86A 35	Games Development: Object Oriented Programming	√	√	√		√									√	√	√	√	√	√
HH3N 35	Computer Games Development: Graded Unit 2	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
F869 34	3D Level editing	√	√	√		√				√	√	√	√	√						√
HH37 34	Game Interface Design				√	√	√	√		√	√		√						√	
HH38 34	2D Animation for Games				√	√	√	√	√	v	√	√	√	√						√
HH39 34	Computer Games: Creating Graphics				√	√	√	√	√	√	√	√	√							√
HF3D 35	Designing and Developing an Interactive Product	√	√	√	√	√	√	v	√	√	√	√	√	√	√	√	√	√	√	√
HH3D 35	Artificial Intelligence for Computer Games	√		√				√							√	√	√	√	√	√
F86H 35	Game Physics	√		√				√							√	√	√	√	√	√
HH3E 35	Game Customisation and Scripting	√		√											√	√	√	√	√	√
HH58 35	Creating a Showreel and Portfolio	√	√	√	√		√	√	√	√	√	√	√	√						√

An additional source of relevant National Occupational Standards for the HNC/HND Computer Games Development comes from IT Professional Standards published by Tech Partnership.

The standards from IT Professional Standards that apply to these qualifications fall under the categories:

(a) Architecture, Analysis and Design

ESKITP4032	Human Needs Analysis Level 2 Role
ESKITP4033	Human Needs Analysis Level 3 Role
ESKITP4062	Human Computer Interaction/Interface (HCI) Design Level 2 Role
ESKITP4063	Human Computer Interaction/Interface (HCI) Design Level 3 Role

(b) Solution Development and Implementation

ESKITP5022v2	Perform software development activities under direction
TECIT50831	Implement user centred development infrastructure processes

All of the above professional standards can be mapped *as* shown in the following table.

Code	Unit title	National Occupational Standards (IT Professional standards)					
		Architecture, Analysis and Design				Solution Development and Implementation	
		ESKITP4032	ESKITP4033	ESKITP62	ESKITP63	ESKITP5022v2	TECIT50831
HH3M 34	Computer Games Development Graded Unit 1	√	√	√	√	√	√
HH57 34	Computer Games: Programming Fundamentals	√	√	√	√	√	√
H178 34	Team working in computing	√	√	√	√	√	√
DH35 34	Computing Planning	√	√	√	√		
HI7D 34	Computing: Introduction to Project Management	√	√				√
HH3F 34	Game Technology					√	√
DE2N 35	3D Modelling and animation			√	√		
F86A35	Games Development: Object Oriented Programming	√	√	√	√	√	√
HH3N 35	Computer Games Development: Graded Unit 2	√	√	√	√	√	√
F86934	3D Level editing						
HH37 34	Game Interface Design	√	√	√	√	√	√
HH38 34	2D Animation for Games			√	√		
HH39 34	Computer Games: Creating Graphics			√	√	√	√
HF3D 35	Designing and Developing an Interactive Product	√	√	√	√	√	√
HH3D 35	Artificial Intelligence for Computer Games	√	√	√	√	√	√
F86H 35	Game Physics					√	√
HH3E 35	Game Customisation and Scripting	√	√	√	√	√	√
HH58 35	Creating a Showreel and Portfolio			√	√	√	√

5.3 Mapping of Core Skills development opportunities across the qualifications

The table below demonstrates whether the Core Skills components developed in each unit are:

E — Embedded which means learners who achieve the unit will automatically have their Core Skills profile updated on their certificate.

S — Signposted which means learners will be developing aspects of Core Skills through teaching and learning approaches but not enough to attract automatic certification.

*Subject to the Core Skills validation within SQA

Unit code	Unit title	Communication			Numeracy		ICT		Problem Solving			Working with Others	
		Written (Reading)	Written (Writing)	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HH3M 34	Computer Games Development: Graded Unit 1								E(SCQF6)	E(SCQF6)	*E(SCQF6)	*E(SCQF5)	*E(SCQF5)
F8HC 34	Computer Games Programming Fundamentals								S(SCQF6)	S(SCQF6)	S(SCQF6)		
H178 34	Team working in computing	S (SCQF6)	S (SCQF6)	S (SCQF6)			E(SCQF6)	E(SCQF6)				E(SCQF6)	E(SCQF6)
DH35 34	Computing Planning								E(SCQF 6)				
HI7D34	Computing: Introduction to Project Management						S(SCQF6)	S(SCQF6)					
F8M3 34	Game Technology				E(SCQF)	E(SCQF5)							
DE2N 35	3D Modelling and animation						S(SCQF6)	S(SCQF6)					
F86A 35	Games Development: Object Oriented Programming								S(SCQF6)	S(SCQF6)	S(SCQF6)		
HH3N 35	Computer Games Development: Graded Unit 2								E(SCQF6)	E(SCQF6)	E(SCQF6)		
F869 34	3D Level editing								E(SCQF5)	E(SCQF5)			
HH37 34	Game Interface Design			S (SCQF5)				S(SCQF5)			S(SCQF6)	S(SCQF6)	

Unit code	Unit title	Communication			Numeracy		ICT		Problem Solving			Working with Others	
		Written (Reading)	Written (Writing)	Oral	Using Number	Using Graphical Information	Accessing Information	Providing/Creating Information	Critical Thinking	Planning and Organising	Reviewing and Evaluating	Working Co-operatively with Others	Reviewing Co-operative Contribution
HH38 34	2D Animation for Games							S(SCQF5)		S(SCQF5)	S(SCQF5)		
HH39 34	Computer Games: Creating Graphics						S(SCQF6)	S(SCQF6)		S(SCQF5)	S(SCQF5)		
HF3D 35	Designing and Developing an Interactive Product								E(SCQF6)	E(SCQF6)	E(SCQF6)		
F871 35	Artificial Intelligence for Computer Games								S(SCQF6)	S(SCQF6)	S(SCQF6)	S(SCQF6)	S(SCQF6)
F86H 35	Game Physics				E(SCQF6)	E(SCQF6)			E(SCQF6)				
F8L235	Game Customisation and Scripting								S(SCQF6)	S(SCQF6)	S(SCQF6)		
HH58 35	Creating a Showreel and Portfolio						S(SCQF6)	S(SCQF6)	S(SCQF6)	S(SCQF6)	S(SCQF6)		
HH3H 34	Computer Programming: Applied Mathematics				E*(SCQF5)	E*(SCQF5)			E*(SCQF5)	E*(SCQF5)	E*(SCQF5)		
HH3L 35	Computer Programming: Applied Mathematics				E*(SCQF6)	E*(SCQF6)			E*(SCQF6)	E*(SCQF6)	E*(SCQF6)		

5.4 Mapping of Computational Thinking opportunities across the qualification

Computational Thinking is an important and fundamental skill that can be developed to assist in solving problems. By studying methods used in computation a set of skills can be utilised as part of the problem solving processes. The skills include the ability to:

1 Collate, Analyse and logically organise data
2 Abstract and represent data
3 Be innovative and creative
4 Apply algorithmic thinking
5 Recognise patterns
6 Transfer prior learning to similar problems
7 Recognise sustainable and efficient solutions

Unit code	Unit title	Aspects of Computational Thinking
HH3M 34	Computer Games Development: Graded Unit 1	1–7
HH57 34	Computer Games: Programming Fundamentals	1–7
H178 34	Team working in computing	1, 2, 3, 7
DH35 34	Computing Planning	1, 2, 4
HI7D 34	Computing: Introduction to Project Management	1, 2
F8M3 34	Game Technology	1, 2
DE2N 35	3D Modelling and animation	3
F86A 35	Games Development: Object Oriented Programming	1–7
F869 34	3D Level editing	3, 4, 5, 6
HH37 34	Game Interface Design	3, 6, 7,
HH3N 35	Computer Games Development: Graded Unit 2	1-7
HH38 34	2D Animation for Games	3, 6, 7,
HH39 34	Computer Games: Creating Graphics	3
HF3D 35	Designing and Developing an Interactive Product	1–7
F871 35	Artificial Intelligence for Computer Games	1–7
F86H 35	Game Physics	1–7
F8L2 35	Game Customisation and Scripting	1–7
HH58 35	Creating a Showreel and Portfolio	1, 2, 3, 6, 7
HH3H 34	Computer Programming: Applied Mathematics	1, 2, 5, 6, 7
HH3L 35	Computer Programming: Applied Mathematics	1, 2, 5, 6, 7

5.4 Assessment Strategy for the qualification(s)

There are many units which may work well together and learners may benefit from being assessed in this way suggestions could be:

- *Team Working in Computing with Computing: Introduction to Project Management*
- *2D Animation for Games and Creating Game Graphics*
- *Computing Planning and Structured Programming for Games*
- *Game Design Theory and Pitch a Treatment*
- Any other suitable combination of units

The purpose of integrating the assessment of units would be to cut down the assessment load on the learners and provide a better learning experience in the way the work is structured. Furthermore, assessments could follow on from each other as units are delivered, an example of this could be Pitch A Treatment then Designing and Developing an Interactive Media Product.

The following are the recommended assessment methods for the mandatory units and some Content selection options.

Unit code	**Unit**	**Assessment**			
		Outcome 1	**Outcome 2**	**Outcome 3**	**Outcome 4**
HH3M 34	Computer Games Development: Graded Unit 1	*Planning phase:* Working in a team, pitch a design proposal, select a design proposal, analysis of approach. Planning documentation including a project plan and individual log books. *Implementation Phase:* Develop a game including functional code and graphical content accompanied by test logs and documentation. Submit individual log books. This is open-book, mentored and observed by tutor to ensure all members of team are contributing and to ensure authenticity of work. *Evaluation Phase:* Individual evaluation report.			
HH57 34	Computer Games: Programming Fundamentals	Open-book series of practical assignments to develop the evidence required.	Open-book — project based practical assignment.	Testing and debugging the assignment issued in Outcome 2.	Demonstration of product and evaluation report.

Unit Code	Unit	Assessment			
		Outcome 1	**Outcome 2**	**Outcome 3**	**Outcome 4**
H178 34	Team working in computing	Assessment is open-book and based on a given Computing/ICT project brief. Checklists are employed by the tutor. The focus of Evidence Requirements is based on the learner participating in a group rather than the product of the group work. It is assessed holistically.			
DH35 34	Computing Planning	This unit should be integrated with a programming unit such as *Structured Programming* F8HC 34, but there are a number of other computing units that it can be integrated with and a holistic approach should be taken. Learners will produce a specification, a detailed design, and a test plan for a given computing task undertaken in the other unit. A single and coherent case study approach is expected. There will be regular and controlled mentoring of the learner's progression through the unit.			
H17D 34	Computing: Introduction to Project Management	Closed-book 20 restricted response questions.	Practical assignment: These Outcomes are assessed together using a contextualised project brief. Evidence takes the form of project file to include Gantt chart and costings.		
HH3F 34	Game Technology	Closed-book 20 restricted response questions.	Closed-book 20 restricted response questions.	Written report open-book conditions.	
DE2N 35	3D Modelling and animation	The assessment for this unit is open-book, holistic and product based and comprises of planning documentation and 3D computer generated models and animations.			
F86A 35	Games Development: Object Oriented Programming	The Outcomes for this assessment are integrated into one project based assignment. The project should require the learner to analyse the problem and design and implement an object oriented solution. The assessment is completed on an individual basis under open-book supervised conditions.			
HH3N 35	Computer Games Development: Graded Unit 2	Practical assignment: Individual project work where the learner must 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, evaluate the product and process, evaluate their own performance. The assessment is open-book and is a consolidation of knowledge and skills gained.			

Unit code	Unit	Assessment			
		Outcome 1	**Outcome 2**	**Outcome 3**	**Outcome 4**
F869 34	3D Level editing	This is one holistic assessment which takes the form of a project requiring the learner to design, create and publish a prototype level within a 3D level editing software package. The assessment should be completed on an individual basis under open-book supervised condition.			
HH37 34	Game Interface Design	Closed-book assessment of 20 Questions covering Knowledge and skills for this Outcome pass mark 60%.	Open-book, undertake research, present a case study.	Open-book, production of interface designs.	
HH38 34	2D Animation for Games	Knowledge based test sampling across the range, closed-book oral or written.	Holistic open-book practical assignment where learners create animations for use in games.		
HH39 34	Computer Games: Creating Graphics	Knowledge based test sampling across the range, closed-book oral or written.	Holistic open-book practical assignment where learners create graphics for use in games.		
HF3D 35	Designing and Developing an Interactive Product	This is one holistic open-book assessment. The learner will create an interactive product based on a given brief. The assessment can be carried out on an individual or team basis. Where a team approach is used, it is expected that the amount of Learner evidence produced is equivalent to the amount of evidence produced per Learner for an individual project. Learners must design, implement, test and evaluate a solution in the form of an interactive product.			
HH3D 35	Artificial Intelligence for Computer Games	Closed-book set of questions to demonstrate knowledge of Outcome 1 content.	Open-book investigative assignment. Learners must produce evidence in the form of a visual and oral presentation. A checklist can be utilized by tutor.	Outcomes 3 and 4 are assessed together as an open-book practical project assignment.	

Unit Code	Unit	Assessment			
		Outcome 1	**Outcome 2**	**Outcome 3**	**Outcome 4**
F86H 35	Game Physics	Closed-book 40 Multiple choice questions.	Outcomes 2 and 3 should be open-book and integrated into one assessment. The evidence should include a solution involving physics and maths to a game scenario where a real-time physics simulation is required. It is recommended that this solution is then implemented in a modern programming language such as Java, C++ or C#.		
HH3E 35	Game Customisation and Scripting	All Outcomes are assessed using a single project requiring the learner to create and collect all the necessary evidence including design, development and analysis work. Learners will produce a technical design document based on the given specification (Outcome 1), develop the actual playable level (Outcomes 2 and 3) as well as conduct and record observed testing of the playable level by third parties. The assessment project should be completed on an individual basis under open-book supervised conditions.			
HH58 35	Creating a Showreel and Portfolio	Outcome 1 is assessed by collation of work into an organized portfolio of content showing a range of work they have undertaken. This will be presented in a suitable format.	For Outcome 2, the best work or excerpts of work should then be carefully selected and made ready for addition to the planned showreel, there should be clear reasons for inclusion.	The showreel is then created in Outcome 3 using video/audio editing software and adding suitable effects to enhance it; the showreel should be between 2–5 minutes duration.	

6 Guidance on approaches to delivery and assessment

The awards have been influenced and developed giving heed to the National Occupational Standards which reflect industry working standards. Notice has also been given to the development of the learners' Core Skills profile. Consequently, emphasis has been given, particularly in the first year, to group based project work and collaborative working. Centres should therefore ensure that facilities are made available to the learners for independent study and group meetings in appropriately equipped facilities.

Another aim of delivery of these awards is to maximise the learning and teaching component of unit delivery and correspondingly reduce the amount of time spent on assessment. Therefore integrating units and assessments can be beneficial. Where possible use of social networking tools and delivery of learning resources to personal internet appliances such as tablet computers and smartphones should be employed in addition to traditional classroom based teaching in order to allow for more flexibility and fluidity in learning activities.

Changes made in the new awards include the presence of new game-specific units such as game graphics, game animation, and game interface design, the intention of which is to keep the award relevant and of greater interest to learners. There have been updates to some pre-existing units where content has been added, changed or updated, therefore centres should ensure they are delivering from the most recent unit specification.

The creation of a showreel and portfolio unit has been added as mandatory to the HND as this was thought to be an essential requirement when seeking employment in the games industry. It will be a skill the learners should be encouraged to continue with into their futures, both as a higher education student and as an employee within the industry as it is likely they will change employment at some time.

A further aim of the new awards is to allow centres to choose from many options so that they can design their courses for their own specialisms, HE articulation routes, and potential needs of local employers. This will be expanded upon in Section 6.2.1.

6.1 Sequencing/integration of units

The new awards have been structured to allow flexibility to centres in their choice and sequencing of units. The HNC Computer Games Development can be delivered as a 12 credit award however, since most learners will progress to HND it is recommended that 15 credits be delivered in HNC, therefore suitable optional units can be selected to accommodate this.

In most circumstances, learners should complete an SCQF level 7 unit before undertaking an associated an SCQF level 8 unit. It is recommended that where possible assessments should be integrated to reduce the assessment load.

Centres should devise their own course plans to suit their scheduling requirements. It is advisable that Year 1 is predominantly populated with SCQF level 7 units and Year 2 with SCQF level 8 units.

The following tables show two versions of sample deliveries of HND Year 1 (HNC) and HND Year 2 over a two semester period.

Sample Delivery 1 — (general)

HNC Computer Games Development			HND Computer Games Development		
Year 1			**Year 2**		
Semester 1 units	**SCQF level**	**Credits**	**Semester 1**	**SCQF level**	**Credits**
Computer Games Programming Fundamentals	7	3	Graded Unit 2	8	2
Computer Planning	7	1	Games Development: Object Oriented Programming	8	3
Animation for Games	7	1	3D Modeling and Animation	8	2
Game Interface Design	7	1	Artificial Intelligence for games	8	2
Team Working in Computing	7	1	Narrative and Genre in Computer Games	8	2
Games Design: Pitch a Treatment	7	1	Interaction Design	8	1
Computing: Introduction to Project Management	7	1	Computer Programming: Applied Mathematics	8	1
Semester 2 units	**SCQF level**	**Credits**	**Semester 2 units**	**SCQF level**	**Credits**
Computer Games Programming Fundamentals (continues)	7	3	Graded Unit 2 (continues)	8	2
Game Technology	7	1	Games Development: Object Oriented Programming (continues)	8	3
Game Graphics	7	1	3D Modeling and Animation (continues)	8	2
Computer Games Development: Graded Unit 1	7	1	Artificial Intelligence for Games (continues)	8	2
Computer Programming: Applied Mathematics	7	1	Narrative and Genre in Computer Games (continues)	8	2
Game Design theory	7	1	Creating a Showreel and Portfolio	8	1
History, Evolution and Impact of Computer Games	7	1	Programming a Game for a Mobile Device	8	1

Sample Delivery 2 — (Code Heavy)

HNC Computer Games Development			HND Computer Games Development		
Year 1			**Year 2**		
Semester 1 units	**SCQF level**	**Credits**	**Semester 1**	**SCQF level**	**Credits**
Computer Games Programming Fundamentals	7	3	Graded Unit 2	8	2
Computer Planning	7	1	Games Development: Object Oriented Programming	8	3
Artificial Intelligence for Games	8	2	3D Modeling and Animation	8	2
Game Interface Design	7	1	Software Development: Event Driven Programming	8	2
Team working in computing	7	1	Designing and Developing an Interactive Product	8	2
Game Customisation and Scripting	8	2	Game Physics	8	2
Computing: Introduction to Project Management	7	1	Computer Programming: Applied Mathematics	8	1
Semester 2 units	**SCQF level**	**Credits**	**Semester 2 units**	**SCQF level**	**Credits**
Computer Games Programming Fundamentals (continues)	7	3	Graded Unit 2 (continues)	8	2
Game Technology	7	1	Games Development: Object Oriented Programming (continues)	8	3
Artificial Intelligence for Games (continues)	8	2	3D Modeling and Animation (continues)	8	2
Computer Games Development: Graded Unit 1	7	1	Designing and Developing an Interactive Media Product (continues)	8	2
Computer Programming: Applied Mathematics	7	1	Software Development: Event Driven Programming	8	2
Game Design theory	7	1	Game Physics (continues)	8	2
Game Customisation and Scripting (continues)	8	2	Creating a Showreel and Portfolio	8	1

Suggestions for Sequencing

The order in which units within the awards are delivered is at the discretion of the centre and should be appropriate to local staffing and timetabling considerations. The following delivery sequence is offered for guidance only. Where the award is being delivered on a part-time basis, the subjects recommended for the first semester within the full-time model of delivery should be delivered in the first academic session of the part-time delivery. Subjects recommended for semester two delivery in the full-time model should be delivered in the second academic session of the part-time delivery model.

During Year 1, it is recommended that *Games Programming Fundamentals* be delivered in conjunction with *Game Interface Design* and *2D Animation for Games* in order to provide opportunities to produce a coherent project.

Computing: Introduction to Project Management should be delivered in Year 1 before delivery of the Graded Unit so that the skills obtained can assist with the planning phase of the *Graded Unit 1*. Project management could be delivered in conjunction *with Team Working in Computing* as this will provide opportunities to integrate the assessment.

Computing: Planning and *Team Working in Computing* should be delivered before *Computer Games Development: Graded Unit 1* to allow learners time to assimilate the skills required for the Graded Unit.

Computer Games Programming Fundamentals allows for introductory learning of programming concepts and as such should commence before other more specialised programming Units.

Centres intending to deliver the HND should include one unit of mathematics in the first year in order to spread the mathematics content evenly across both years.

During Year 2, it is recommended that *Game Development: Object Oriented Programming* be delivered in conjunction with *3D Modelling and Animation* again to provide cross-assessment integration opportunities.

3D Level Editing should be delivered prior to *Game Customisation and Scripting* as there is a natural progression of complexity and skills.

Games Development: Object Oriented Programming, and 3D Modelling and Animation should be delivered before *Computer Games Development: Graded Unit 2* to allow learners time to assimilate the skills required for the Graded Unit.

Showreel and Portfolio creation should be delivered later in Year 2 (HND) to allow learners to have sufficient work from which to select for inclusion in the portfolio and showreel. Time should be allowed to add final project work to the showreel. It should be emphasised to learners that they should keep all their work as they progress through the course so that the best can be selected for use in the showreel unit.

6.2 Recognition of Prior Learning

SQA recognises that learners gain knowledge and skills acquired through formal, non-formal and informal learning contexts.

In some instances, a full Group Award may be achieved through the recognition of prior learning. However, it is unlikely that a learner would have the appropriate prior learning and experience to meet all the requirements of a full Group Award.

The recognition of prior learning may **not** be used as a method of assessing in the following types of units and assessments:

- HN Graded Units
- Course and/or external assessments
- Other integrative assessment units (which may or not be graded)
- Certain types of assessment instruments where the standard may be compromised by not using the same assessment method outlined in the unit
- Where there is an existing requirement for a licence to practice
- Where there are specific health and safety requirements
- Where there are regulatory, professional or other statutory requirements
- Where otherwise specified in an Assessment Strategy

More information and guidance on the *Recognition of Prior Learning* (RPL) may be found on our website **www.sqa.org.uk**.

The following sub-sections outline how existing SQA unit(s) may contribute to this Group Award. Additionally, they also outline how this Group Award may be recognised for professional and articulation purposes.

6.2.1 Articulation and/or progression

The changes in the revised frameworks have been minor and should not affect any existing articulation arrangements between centres and their local hegher Education establishments.

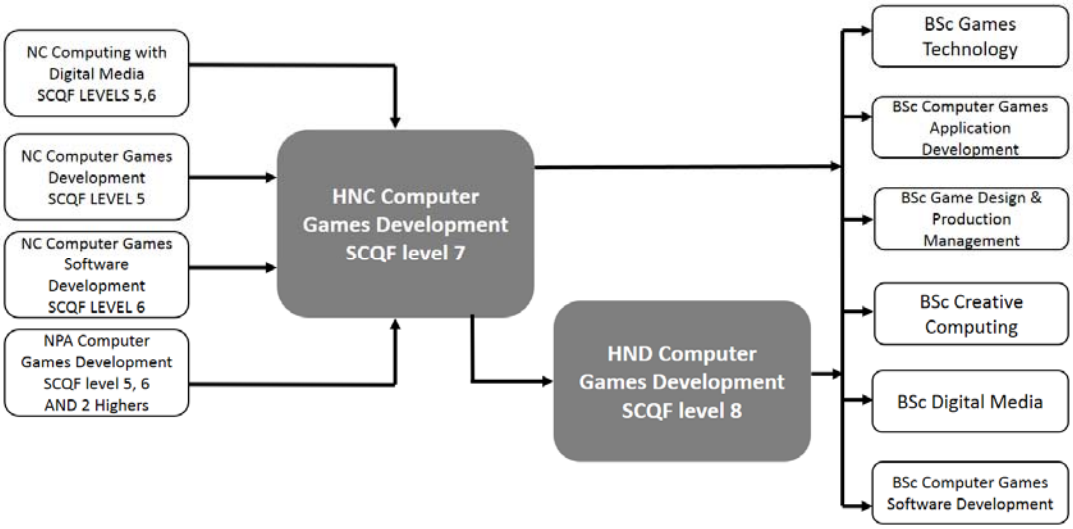
A list of potential articulation routes at the time of writing are shown in the table below these include computing and digital/creative media courses in addition to game-specific courses.

Institute	Degree Program	Entry Point	Conditions
Abertay	BA (Hons) Game Design and Production Management	1	HNC with Graded Unit: A
	BA (Hons) Game Design and Production Management	2	HND with Graded Unit 2: A
	BSc (Hons) Game Technology	1	HNC or HND with Graded Unit: A plus Higher Maths: B
	BSc (Hons) Game Technology	2	HND with Graded Unit 2: A plus Advanced Higher Maths: B
	BSc (Hons) Computer Game Applications Development	1	HNC with Graded Unit: A (if no Higher Maths)
	BSc (Hons) Computer Game Applications Development	2	HNC with Graded Unit: A plus Higher Maths: B
	BSc (Hons) Computer Game Applications Development	2	HND with Graded Unit 2: A plus Higher Maths: B
	BSc (Hons) Computing	2	HNC with Graded Unit: A
	BSc (Hons) Computing	3	HND with Graded Unit 2: A plus Module F86A Games Development OOP or Module H171 Software Development OOP
	BSc (Hons) Ethical Hacking	1	HNC with Graded Unit: A
	BSc (Hons) Ethical Hacking	2	HND with Graded Unit: A
Dundee	BSc (Hons) Computing Science	1	HNC with Graded Unit B
	BSc (Hons) Computing Science	2	HNC with Graded Unit A HND with Graded Units B,B
Edinburgh Napier	BSc (Hons) Creative Computing	2	HNC with Graded Unit B
	BSc (Hons) Creative Computing	3	HND with Graded Units B, B
	BSc (Hons) Digital Media	2	HNC with Graded Unit B
	BSc (Hons) Digital Media Global	3	HND with Graded Units B, B
	BSc (Hons) Interactive media design	2	HNC with Graded Unit B
	BSc (Hons) Interactive media design	3	HND with Graded Units B, B
	BSc (Hons) Games Development	2	HNC with Graded Unit B and Higher Maths at B
	BSc (Hons) Computing	2	HNC with Graded Unit B
	BSc (Hons) Computing	3	HND with Graded Units B, B
Glasgow Caledonian	BSc (Hons) Computer Games Design	2	15 credit HNC Graded Unit at A. Must include the following units: Mathematics for Interactive Computing: Essential Techniques OR Mathematics: Calculus and Matrices for Computing
	BSc (Hons) Computer Games Design	3	HND Computer Games Development with A, A in Graded Units. Must include the following units: Mathematics for Interactive Computing: Essential Techniques or Mathematics: Calculus and Matrices for Computing; 2D

Institute	Degree Program	Entry Point	Conditions
			Animation; 3D Level Editing; Game Customisation and Scripting; Game Design: Pitch to Treatment; Game Design Theory
	BSc (Hons) Computer Games Software Development	2	15 credit HNC Computer Games Development with Graded Unit at A. (with the code heavy delivery model) Must include the following units: Mathematics for Interactive Computing: Essential Techniques or Mathematics: Calculus and Matrices for Computing.
	BSc (Hons) Computer Games Software Development	3	HND Computer Games Development (with the code heavy delivery model) HND must include an A in Graded Units. Must include the following units in the HND: Mathematics for Interactive Computing: Essential Techniques or Mathematics: Calculus and Matrices for Computing; User Interface Design and any TWO from: AI and Critical Thinking; Game Customisation and Scripting; Game Physics; Scripting for Interactivity
	BSc (Hons) Computer Games Indie Development	2	HND Computer Games Development (with the code heavy delivery model) HND must include an A in the Graded Units and the following units: Mathematics for Interactive Computing; Essential Techniques or Mathematics: Calculus and Matrices for Computing; User Interface Design and any two from: AI and Critical Thinking; Game Customisation and Scripting; Game Physics; Scripting for Interactivity; 2D Animation; 3D Level Editing; Game Design: Pitch to Treatment; Game Design Theory; Game Customisation and Scripting
Herriot watt	BSc (Hons) Computer Science (Games Programming)	2	HNC with Graded Unit A and proficiency in the java programming language
	BSc (Hons) Computer Systems (Games Programming)	3	HND with Graded Units A and proficiency in the java programming language
	BSc (Hons) Information Systems (Interaction Design)	2	HNC with Graded Unit A and proficiency in the java programming language
	BSc (Hons) Information Systems (Interaction Design)	3	HND with Graded Units A and proficiency in the java programming language

Institute	Degree Program	Entry Point	Conditions
Robert Gordons University (Aberdeen)	BSc (Hons) Computer graphics and animation	2	HNC/HND applicants considered on an individual basis. All applicants to yr2 must pass a 2 week access course in Java programming
	BSc (Hons) Digital Media - Design, Production and Development	2	HNC/HND applicants considered on an individual basis.
	BSc (Hons) Digital Media - Design, Production and Development	3	A relevant HND from one of our partner colleges will be considered for entry into Year 3.
University of the West of Scotland (UWS)	BSc Hons Computer Games Development	1	HNC
	BSc Hons Computer Games Development	2	HND
	BSc Hons Computer Games Technology	1 or 2	HND Individual case-by-case basis

Qualifications Progression Map



6.2.2 Transitional Arrangements

HN awards in Computing disciplines have always provided detailed guidance on credit transfer between existing and new awards. This is done, at the request of centres and External Verifiers, to ensure consistency between centres. Nevertheless, final decisions relating to credit transfer lies with centres.

These awards are revisions to existing awards; some older units have been replaced with newer ones and some new units have been added which are more subject specific and relevant to the skills required. Consequently these units have been mapped for credit transfer so that if a learner has an existing unit they do not have to be entered for the corresponding revised unit. They would need to be entered for the remaining units and Graded Units required to achieve the HND.

6.2.3 Credit transfer

When new Group Awards are introduced, students often wish to transfer between the old and the new frameworks. For example, they may have started on an HNC under an older framework and wish to complete their HND on the new framework, or they may have completed Units some time ago and wish to use these as part of an HNC or HND under the new framework.

To assist in this process, SQA normally provides centres with guidance on Credit Transfer between the old and the new frameworks. SQA have clear criteria for deciding if two syllabuses are equivalent. All the following criteria must be satisfied if full credit transfer is to be recognised between both syllabuses:

1 The syllabuses have the same SCQF levels.
2 The syllabuses have the similar credit values (or equivalent).
3 The syllabuses are equivalent in terms of Core Skill coverage.
4 The syllabuses relate to the same subject area and the main topics are common to both.
5 The syllabuses present a similar level of cognitive demand.
6 The syllabuses encompass similar skill-sets.
7 The syllabuses are contemporary in terms of terminology, techniques and technology.
8 Employers, admission officers and other users would perceive both syllabuses as broadly equivalent.
9 The assessment demands are similar in terms of learner activity and Performance Criteria, or learners would be equally likely to pass both assessments.
10 Special conditions (where they exist) are applicable to both syllabuses.

This guidance is of an advisory nature.

The final decision on whether or not to grant credit transfer must be made by the centre and is subject to external verification. However, external verifiers are unlikely to raise objections to any credit transfer based on the advice given here.

These Group Awards have been available since 2010 and they replaced an older HNC Group Award, dating back to 2005. This section covers **full** credit transfer from Units in the 2010 Group Awards to Units in the 2016 Group Awards.

2010 Group Award Units		**2016 Group Award Units**	
Unit No	**Unit title**	**Unit No**	**Unit title**
DH21 34 D75X 34	Working Within a Project Team **and** Information Technology: Applications Software 1	H178 34	Team Working in Computing
F1W0 34	Project Management for IT	H17D 34	Computing: Introduction to Project Management
F1VV 34 HF55 34	User Interface Design **or** User Interface Design	HH37 34	Game Interface Design
F209 34	2D Animation	HH38 34 HH39 34	2D Animation for Games Plus another single credit graphics unit such as Computer Games: creating graphics
DE32 35	Scripting for Interactivity	HF3D 35	Designing and Developing an Interactive Product
F0N0 35	Professional Issues in Computing	H1F7 34	Professionalism and Ethics in Computing
DH32 35	Software Development: Developing for the World Wide Web	H1J9 35	Software Development: Developing Websites for Multiplatform Use
D76V 35	Software Development Object Oriented Programming	H171 35	Software Development: Object Oriented Programming
DH2T 34 DH33 34	Computer Architecture 1 AND Computer Operating Systems 1	H175 34	Computer Systems Fundamentals
H4L6 34	Computer Games Development: Graded Unit 1	HH3M 34	Computer Games Development: Graded Unit 1
F8M3 34	Game Technology	HH3F 34	Game Technology
F871 35	Artificial Intelligence and Critical Thinking	HH3D 35	Artificial Intelligence for Computer Games

2010 Group Award Units		2016 Group Award Units	
Unit No	**Unit title**	**Unit No**	**Unit title**
F8L2 35	Game Customisation and Scripting	HH3E 35	Game Customisation and Scripting
F88D 34	Games Design: Pitch to Treatment	HH3G 34	Games Design: Pitch a Treatment
F20D 34	Digital Media: Video	HF51 34	Digital Media: Video
F20C 34	Digital Media: Audio	HF 50 34	Digital Media: Audio
H17J 34	Developing Mobile Web based Applications: An Introduction	HF4Y 34	Developing Mobile Web based Applications: An Introduction
H4LE 35	Computer Games Development Graded Unit 2	HH3N 35	Computer Games Development Graded Unit 2
F8HC 34	Structured Programming for Games	HH57 34	Computer Games: Programming Fundamentals
F6B6 35	Showreel, Portfolio and Curriculum Vitae	HH58 35	Creating a Showreel Portfolio AND HG1K 34 Professional Career Development in the IT Industry
DE3R 34	Personal Development Planning	HG1K 34	Professional Development in the Computer Industry
H2X8 35	Designing and Developing an Interactive Media Product	HF3D 35	Designing and developing an interactive product
F1YX 34	Digital Imaging: Bitmap and Vector	HH39 34	Computer Games: Creating Graphics

6.3 Opportunities for e-assessment

As part of an assessment strategy, centres are encouraged to investigate the option of e-assessment to support the awards. E-assessment may take a number of forms, and while it may be feasible in the future to conduct all assessment in an on-line format, currently some formats are more amenable to e-assessment than others.

The most obvious format is that of objective tests, eg multiple-choice or short-response tests, and some SQA Units already have an Evidence Requirement mandating the use of this type of test.

There are many opportunities for e-assessment in these awards, for example:

- Objective question based closed-book assessments
- The use of e-portfolios
- Use of photographic and/or video for some of the open-book assessments
- Use of social media for team collaboration
- Use of shared accounts for teamwork
- Use of project management e-tools
- Use of blogs for logging activity as evidence where required

Each unit specification includes suggestions of how e-assessments might be used effectively. Some SQA Units already have e-assessment developed on SOLAR (www.sqasolar.org.uk) and centres are encouraged to use these where appropriate.

Below is a sample of Units within the Group Award where e-assessment may readily be adopted:

Unit Examples for multiple-choice/short-response e-assessment opportunities		
Unit title	**Code**	**Outcome**
Game Technology	HH3F 34	1
User Interface Design	HF55 34	1
Game Interface Design	HH37 34	1
Artificial Intelligence for Computer Games	HH3D 35	1
Computer Games: Creating Graphics	HH39 34	1
2D Animation for Games	HH38 34	1
Computer Games: Interaction Design	HH3A 35	1

Unit examples for e-portfolio opportunities			
Unit title	**Code**	**Outcome**	**Type**
Computer Games Development: Graded Unit 1	HH3M 34	Planning and Development work	Collaborative project management, Blog/video diary, Record of meetings, final product, team planning docs.
Computer Games Development: Graded Unit 2	HH3N 35	ALL	Collation of all components of the individual project work.
Artificial Intelligence for Computer Games	F871 35	2–4	Team work documentation, solution development.
3D Modelling and Animation	DE2N 35	ALL	Planning docs, storyboards, models.
Team Working in Computing	H178 34	ALL	Collaborative project management, Blog/video diary, Record of meetings, final product, team planning documents.
Personal Development Planning	DE36 34	ALL	Personal online CV, Links to social media, planning progress/goal setting documentation, relevant links for career or learning progression, blogging, video diary.
Creating a Showreel and Portfolio	HH58 35	ALL	Collate all evidence into an e-portfolio.

6.4 Support materials

A range of Assessment Support Packs (ASPs) have been produced for a number of mandatory and optional Units in this Group Award. These packs are available on the SQA secure website and access can be sought through the SQA coordinator in each centre.

6.5 Resource requirements

The mandatory SCQF level 8 units in this award will require the use of a modern object orientated integrated development environment such as Eclipse or Microsoft's Visual Studio. Eclipse is an open source development environment available from **www.eclipse.org**. The express version of Visual Studio is available as a free download from **www.microsoft.com/visualstudio** although the professional versions do offer some benefits. At the time of writing it is envisaged that the mandatory Units would best be delivered using either Java or C#.

For units in relation to developing 2D and 3D imaging and animation, software can be purchased with non-commercial educational licenses. There are also some free limited versions of most high end software packages available at the time of writing. In addition there are many open source lesser known 3D and 2D software brands that could also be used to produce the required evidence.

The requirement for ongoing staff CPD in relation to developments in ICT should be independent of new course development.

7 General information for centres

Equality and inclusion

The Unit specifications making up this Group Award have been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners will 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**.

Internal and external verification

All instruments of assessment used within this/these qualification(s) should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in SQA's Guide to Assessment (**www.sqa.org.uk/GuideToAssessment**).

8 Glossary of terms

Embedded Core Skills: is where the assessment evidence for the Unit also includes full evidence for complete Core Skill or Core Skill components. A learner successfully completing the Unit will be automatically certificated for the Core Skill. (This depends on the Unit having been successfully audited and validated for Core Skills certification.)

Finish date: The end of a Group Award's lapsing period is known as the finish date. After the finish date, the Group Award will no longer be live and the following applies:

- learners may not be entered for the Group Award
- the Group Award will continue to exist only as an archive record on the Awards Processing System (APS)

Graded Unit: Graded Units assess learners' ability to integrate what they have learned while working towards the Units of the Group Award. Their purpose is to add value to the Group Award, making it more than the sum of its parts, and to encourage learners to retain and adapt their skills and knowledge. (Note to writer: delete if not applicable to product type)

Lapsing date: When a Group Award is entered into its lapsing period, the following will apply:

- the Group Award will be deleted from the relevant catalogue
- the Group Award specification will remain until the qualification reaches its finish date at which point it will be removed from SQA's website and archived
- no new centres may be approved to offer the Group Award
- centres should only enter learners whom they expect to complete the Group Award during the defined lapsing period

SQA credit value: The credit value allocated to a Unit gives an indication of the contribution the Unit makes to an SQA Group Award. An SQA credit value of 1 given to an SQA Unit represents approximately 40 hours of programmed learning, teaching and assessment.

SCQF: The Scottish Credit and Qualification Framework (SCQF) provides the national common framework for describing all relevant programmes of learning and qualifications in Scotland. SCQF terminology is used throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at **www.scqf.org.uk**.

SCQF credit points: SCQF credit points provide a means of describing and comparing the amount of learning that is required to complete a qualification at a given level of the Framework. One National Unit credit is equivalent to 6 SCQF credit points. One National Unit credit at Advanced Higher and one Higher National Unit credit (irrespective of level) is equivalent to 8 SCQF credit points.

SCQF levels: The level a qualification is assigned within the framework is an indication of how hard it is to achieve. The SCQF covers 12 levels of learning. HNCs and HNDs are available at SCQF levels 7 and 8 respectively. Higher National Units will normally be at levels 6–9 and Graded Units will be at level 7 and 8. National Qualification Group Awards are available at SCQF levels 2–6 and will normally be made up of National Units which are available from SCQF levels 2–7.

Subject Unit: Subject Units contain vocational/subject content and are designed to test a specific set of knowledge and skills.

Signposted Core Skills: refers to opportunities to develop Core Skills arise in learning and teaching but are not automatically certificated.

History of changes

It is anticipated that changes will take place during the life of the qualification and this section will record these changes. This document is the latest version and incorporates the changes summarised below. Centres are advised to check SQA's APS Navigator to confirm they are using the up to date qualification structure.

NOTE: Where a Unit is revised by another Unit:

- No new centres may be approved to offer the Unit which has been revised.
- Centres should only enter learners for the Unit which has been revised where they are expected to complete the Unit before its finish date.

Version Number	Description	Date
2	Full credit transfer between F1YX 34 Digital Imaging: Bitmap and Vector and HH39 34 Computer Games: Creating Graphics added	07/03/2017

Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of this qualification.

9 General information for learners

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

The aims of these qualifications are to provide you with the necessary skillset to progress to university courses in games development or to pursue employment at a junior level in the games industry. The awards are primarily for programmers rather than designers.

In HNC you will learn a range of introductory topics relating to computer games with an emphasis on programming and collaborative working.

In HND you will further develop your programming skills and increase your knowledge of games to prepare you for entrance to university degree programs at Year 2 or 3.

The main focuses of the awards are to enable you to learn:

- How to program and develop computer games.
- How to work as part of a team.
- How to develop games concepts through all the development stages to the creation of functional games.
- How to analyse games and understand theoretical aspects of games design.

There are many skills you will learn as you progress, namely:

- Games Programming in a high level language
- Organisational skills in planning and project management, both in teams and individually
- Performing mathematical and technical calculations for games programming
- Creating, editing and animating 2D and 3D graphics to use in games
- Prototyping and designing Games interfaces suitable for specific genres
- Presenting and pitching concepts and final products

Entrance to the HNC is suitable for a range of learners, including:

- Learners articulating from National Progression Awards in Computer Games Development or another relevant discipline such as National Certificate in Computing with Digital Media.
- Learners articulating from school with two Highers and a range of National 5 subjects.
- At the discretion of a centre, you may be permitted to enter the award by waiving some of the entry requirements based on your previous experience.

To achieve the HNC award you will need to achieve a minimum of 12 SQA credits from the Group Award framework including all six of the mandatory units. To Progress to the HND and to many university degree programs Years 1 or 2, you will need to achieve 15 SQA credits.

To achieve the HND award you will need to achieve 30 SQA credits from the Group Award framework including all nine of the mandatory units.

Entry level employment from these awards could include job roles such as Quality Assurance Games Testers, Games Programmers internships or apprenticeships. However, most employers within the industry require a degree level qualification.