



Arrangements for:
**National Progression Award in
Laboratory Science at SCQF level 6**

Group Award Code: G9G6 46

Validation date: June 2009

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Version: 6

Acknowledgement

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

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.

Version number	Description	Date
6	HP9W 45 Mathematics for Science 2 has been added as an alternative to F3T8 11 Mathematics for Science	September 2017
5	D934 12 Experimental Procedures-Biology (finish date 31/07/2019) has been revised by HN89 46 Experimental Procedures-Biology (Start date: 01/08/2017) D935 12 Experimental Procedures-Chemistry (finish date 31/07/2019) has been revised by HN8A 46 Experimental Procedures-Chemistry (Start date: 01/08/2017) D937 12 Experimental Procedures-Science (finish date 31/07/2019) has been revised by HN8D 46 Experimental Procedures-Science (Start date: 01/08/2017)	June 2017
4	National 5 Biology Units added to the framework within a restricted grouping.	February 2015
3	Revision of Unit: FH2G 12 DNA and the Genome <i>has been revised by H4KD 76 Biology: DNA and the Genome and will finish on 31/07/2016.</i> Revision of Unit: FH2J 12 Interdependence and Sustainability <i>has been revised by H4KF 76 Biology: Interdependence and Sustainability and will finish on 31/07/2016.</i> Revision of Unit: FH2H 12 Metabolism and Survival <i>has been revised by H4KE 76 Biology: Metabolism and Survival and will finish on 31/07/2016.</i> Revision of Unit: FH2K 12 Human Cells <i>has been revised by H4L8 76 Human Biology: Human Cells and will finish on 31/07/2016.</i> Revision of Unit: FH2N 12 Immunology and Public Health <i>has been revised by H4LB 76 Human Biology: Immunology and Public Health and will finish on 31/07/2016.</i> Revision of Unit: FH2M 12 Neurobiology and Communication <i>has been revised by H4LA 76 Human Biology: Neurobiology and Communication and will finish on 31/07/2016.</i> Revision of Unit: FH2L 12 Physiology and Health <i>has been revised by H4L9 76 12 Human Biology: Physiology and Health and will finish on 31/07/2016.</i>	January 2015
2	Revision of Unit: D068 11 Acids, Bases and Metals <i>has been revised by H21L 75 Chemistry in Society and will finish on 31/07/2018.</i> Revision of Unit: D066 11 Building Blocks <i>has been revised by H21G 75 Chemical Changes and Structures and will finish on 31/07/2018.</i> Revision of Unit: D067 11 Carbon Compounds <i>has been revised by H21J 75 Nature's Chemistry and will finish on 31/07/2018.</i>	June 2014

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1 Introduction

This is the Arrangements Document for the new Group Award in Laboratory Science at SCQF level 6, which was validated in June 2009. This document includes: rationale for the development of the Group Award, its aims, guidance on access, details of the Group Award structure, and guidance on delivery.

The award title National Progression Award in Laboratory Science, reflects the scientific nature of the award and is linked to the skills required to become competent to work in a laboratory environment. The general approach is to develop good technical, investigative and problem solving skills. Candidates for this award will be able to work in a broad range of companies; hence the title of the award is generic enough to reflect the diversity of the science industry in Scotland.

The award aims to provide underpinning knowledge to support the SVQ in Laboratory Science at level 2.

2 Rationale for the development of the Group Award

In recent years industry has expressed concern over the lack of availability of technically competent people to work in science laboratories. Companies were finding that university graduates lacked the required skills, which meant that considerable effort had to be put into re-training graduates for the jobs. The second problem for many companies was that there was a high staff turnover. To address these issues SEMTA and the science industry developed a Modern Apprenticeship in Life Sciences for technicians and technologists. This qualification is designed to underpin the vocational part of the Modern Apprenticeship. It will be available to those on the MA and for professional development of the existing workforce.

3 Aims of the Group Award

3.1 Principal aims of the Group Award

The overall aim is to provide a progressive, integrated and coherent education which will meet the needs of candidates, employers and higher institutions. Specifically these are to:

- ◆ **develop candidates' knowledge and skills** such as planning, analysis and laboratory techniques in the area of science.
- ◆ **develop employment prospects** enhancing candidates' underpinning knowledge to support a wide range of practical laboratory skills and technologies. Candidates will also become familiar with 'soft skills' such as learning to work on their own or in a team environment as well as developing skills in producing oral and written reports and enhancing their presentation and communication skills.
- ◆ **enable progression** within the SCQF framework to the PDA Laboratory Science or HNC/HNDs in Science.
- ◆ **develop study and research skills** in the area of science.
- ◆ **develop transferable skills** including Core Skills to be demonstrated across all Units including IT skills, statistics, presentation skills, working in a team and problem-solving.

- ◆ **develop in the candidate skills of independent study and communication** and an informal sense of the responsibility attached to the work of laboratory scientists

3.2 General aims of the Group Award

- ◆ **prepare candidates for an appropriate level of employment**, in science areas such as research and industrial laboratories; biotechnology, chemical, microbiological, pharmaceutical, and environmental industries.
- ◆ **develop a range of contemporary vocational skills** relating to the use, support and development of systems appropriate to employment at technician or professional level.
- ◆ **develop options to permit an element of vocational specialisation** in a variety of biological science areas.
- ◆ **prepare candidates for progression to further studies** in science related disciplines.
- ◆ **provide a flexible route to a qualification**, meeting demand, for example, for those already in employment. The unitised structure of the Course and the intended modes of delivery will provide access to this qualification from those in employment through day-release provision and for direct entry or seconded candidates through full-time provision. Discrete Units will also be available for study.
- ◆ **provide candidates with a wide range of practical laboratory skills** to further enhance job prospects through the practical content of the Course.

3.3 Target audience

The existing HN and NQ Sciences programmes are already popular in delivering colleges, and it is envisaged that the more flexible and industry tailored NPA programme will improve candidates' employment and progression prospects.

This Course will be attractive to a diverse group of learners including those in employment, school leavers, adult returners and Modern Apprentices. It is thought that in the main learners will study on a part time basis and be in employment (possibly undertaking the Modern Apprenticeship).

The NPA is intended to act both as a vocational qualification to meet the workforce demands of the science industry and as an entry route to Higher Qualifications at Scottish Colleges and Universities, particularly those degrees and Higher National Qualifications covering areas of the sciences.

The NPA in Laboratory Science is designed to support the development of laboratory 'technicians' (those undertaking routine laboratory assistant duties) and will be included in the Life Sciences level 2 Modern Apprenticeship. This Group Award is levelled at SCQF level 6.

Target audience

- ◆ School leavers
- ◆ Adult returners
- ◆ Graduates seeking ‘Technical Skills’
- ◆ Employed Laboratory Technicians/Technologists. (Lifesciences, NHS, Chemicals, Food and Drink etc)

4 Access to Group Award

It is intended that admission to this Course should be as broad based as possible, but that this should be consistent with the selection of candidates who have a reasonable chance of successfully completing the Course. In many cases candidates will already be working in a science laboratory as an apprentice or undertaking the Course as part of their professional development. The following entry requirements are given as guidelines only:

- ◆ At least three passes at SCQF level 5, one of which should be in science
- ◆ If candidates do not have chemistry at SCQF level 5 they will complete level 5 chemistry bridging Units initially as an integral component of their Course
- ◆ Core Skills should be at SCQF level 5 for *Numeracy*, with the others at SCQF level 4
- ◆ Any other equivalent qualifications

Alternative access arrangements

The presenting centre may operate alternative access arrangements in cases where the candidate is convinced s/he already has the required competences in a given area. These arrangements are as follows:

- ◆ Assessment on demand
- ◆ Credit transfer
- ◆ Accreditation of prior learning
- ◆ Relevant Work Experience, eg science industries, medical and NHS laboratories

Individual presenting centres will outline their systems for each of these as appropriate.

5 Group Award structure

The award comprises a combination of mandatory Units and optional Units. Options will be selected in partnership with delivering colleges. The college must advise on the most appropriate Units to ensure:

- ◆ competence
- ◆ progression and articulation
- ◆ possible progression to HNC/HND
- ◆ employer needs

5.1 Framework

Candidates must complete a minimum of 8 credits

Each candidate must complete the four mandatory Units. Candidates must then select a minimum of two and a maximum of four options from either section B or Section C. Up to two bridging Units may be selected from Section A.

	Unit title	Code	SCQF credit points	SCQF level	SQA credit value
MANDATORY (4 credits)	Quality and Health and Safety Systems in Science Industries	DF82 34	8	7	1
	Fundamental Chemistry: an Introduction	DX29 33	8	6	1
	Mathematics for Science Or Mathematics for Science 2	F3T8 11 HP9W 45	6 6	5 5	1 1
	Microbiological Techniques	D042 12	6	6	1

Options — 0–2 from Section A					
Options Section A (0–2 credits) maximum	Animal Physiology	D028 11	6	5	1
	Biotechnology Processes	DF5G 11	6	5	1
	Living Cells	D026 11	6	5	1
	OR				
	Biology Life on Earth	H209 75	6	5	1
	Biology: Multicellular Organisms	H208 75	6	5	1
	Cell Biology	H207 75	6	5	1
	*Chemistry in Society	H21L 75	6	5	1
	*Chemical Changes and Structure	H21G 75	6	5	1
	The Biology of Micro-organisms	DF5F 11	6	5	1
	*Nature's Chemistry	H21J 75	6	5	1
	Electrical Fundamentals	D132 11	6	5	1
	Environmental Biology and Genetics	D027 11	6	5	1
	The Human Body	F1RH 11	6	5	1
Living Cells	D026 11	6	5	1	
Working with Micro-organisms	D039 11	6	5	1	

	Radioactivity	D382 11	6	5	0.5
	Science Investigation Skills	F3TB 11	6	5	0.5
	Systems and Control	D187 11	6	5	1
	Waves and Optics	D381 11	6	5	0.5

*refer to history of changes for revision details

	Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Options — 2–4 from Section B OR 2–4 from Section C					
Options Section B (2–4 credits) maximum	Chemical Reactions	D071 12	6	6	1
	Energy Matters	D069 12	6	6	1
	The World of Carbon	D070 12	6	6	1
	OR				
	Principles to Production	FE4D 12	6	6	1
	Consumer Chemistry	FE4F 12	6	6	1
	Periodicity, Polarity and Properties	FE4H 12	6	3	0.5
	Researching Chemistry	FE4J 12	6	3	0.5
	OR				
	Chemical Changes and Structure	H4KH 76	6	3	0.5
	Researching Chemistry	H4KK 76	6	3	0.5
	Nature's Chemistry	H21J 76	6	6	1
	Chemistry in Society	H21L 76	6	6	1
	Cell Biology	D029 12	6	6	1
	Control and Regulation	D031 12	6	6	1
	Genetics and Adaptation	D030 12	6	6	1
	OR				
	*Biology: DNA and the Genome	H4KD 76	6	6	1
	*Biology: Metabolism and Survival	H4KE 76	6	6	1
	*Biology: Sustainability and Interdependence	H4KF 76	6	6	1
	Biotechnology	DF5J 12	6	6	1
	*Experimental Procedures – Science	HN8D 46	6	6	1
	*Experimental Procedures – Chemistry	HN8A 46	6	6	1
	*Experimental Procedures – Biology	HN89 46	6	6	1
	Genetics and Adaptation	D030 12	6	6	1
	Engineering: Measurement Technology - Pressure/Level	F5KT 12	6	6	1
Microbiology	DF5H 12	6	6	1	
Engineering: Process Control	F5KK 12	6	6	1	
Engineering: Process Control Systems	F5KW 12	6	6	1	
Process Chemistry: an Introduction	F6X9 12	6	6	1	

OR

Options Section C	Cell Function and Inheritance	D043 12	6	6	1
	The Continuation of Life	D044 12	6	6	1
	Behaviour, Populations and the Environment	D045 12	6	6	1
	OR				

(2–4 credits) maximum	*Human Biology: Human Cells	H4L8 76	6	6	1
	*Human Biology: Physiology and Health	H4L9 76	6	6	1
	*Human Biology: Neurobiology and Communication	H4LA 76	6	3	0.5
	*Human Biology: Immunology and Public Health	H4LB 76	6	3	0.5
	Biotechnology	DF5J 12	6	6	1
	Chemical Reactions	D071 12	6	6	1
	Experimental Procedures – Science	HN8D 46	6	6	1
	Energy Matters	D069 12	6	6	1
	Experimental Procedures – Chemistry	HN8A 46	6	6	1
	Experimental Procedures – Biology	HN89 46	6	6	1
	Microbiology	DF5H 12	6	6	1
	Engineering: Measurement Technology - Pressure/Level	F5KT 12	6	6	1
	Engineering: Process Control	F5KK 12	6	6	1
	Engineering: Process Control Systems	F5KW 12	6	6	1
	Process Chemistry: an Introduction	F6X9 12	6	6	1
	The World of Carbon	D070 12	6	6	1

Core Skills

This award have been designed using the new design principles and therefore the importance of Core Skills has been recognised and these are developed throughout the award. These Core Skills may be embedded in the entry qualifications that the presenting candidates have already achieved, eg *Problem Solving* at SCQF level 5 is embedded in all Science Highers. It should be noted that although there is no mandatory entry and exit levels the following is recommended:

Core Skill	Recommended Entry level	Recommended Exit level
Communication	Intermediate 1	Intermediate 2
Numeracy	Intermediate 2	Higher
Information Technology	Intermediate 1	Intermediate 2
Problem Solving	Intermediate 1	Intermediate 2
Working with Others	Intermediate 1	Intermediate 2

5.2 Mapping information

Appendix 1 details the mapping of the National Occupational Standards to the National Progression Award. Each mandatory Unit has been mapped to the appropriate National Occupational standards.

5.3 Articulation, professional recognition and credit transfer

In designing the award, the Development Group was fully aware of the need for the qualification to contain relevant technical and transferable skills to enable immediate entry to employment while at the same time allowing articulation to degree courses. The Development Group ensured that an appropriate balance between academic and vocational knowledge and skills was achieved through the mix of Unit content and teaching approaches. Care was taken in the design of this award to ensure that topics and Units required to maintain articulation routes were included. Thus no difficulties are foreseen in developing and maintaining existing articulation routes.

Articulation agreements are already in place for the existing HNC/HND Science awards. Progression can be facilitated from NPA to PDA and onto HNC/HND. Examples of existing support from various universities are as follows:

Examples of existing articulation arrangements (HND)

HE Institution	Articulation from HND
University of the West of Scotland	Third year of BSc (Hons) Sciences
Glasgow Caledonian University	Third year of BSc (Hons)
University of Strathclyde	Second year of BSc (Hons)
University of Edinburgh	Third year of BSc
University of Stirling	Second year of BSc
Napier University, Edinburgh	Third year of BSc
University of St Andrews	Second/third year of BSc (Hons)
Robert Gordon University, Aberdeen	Third year of BSc
University of Abertay, Dundee	Third year of BSc
University of Dundee	Second/third year of BSc
Heriot Watt University	Third Year of MChem

Moreover, the clearly defined progression routes in Figure 1 (page 8) highlight learning pathways.

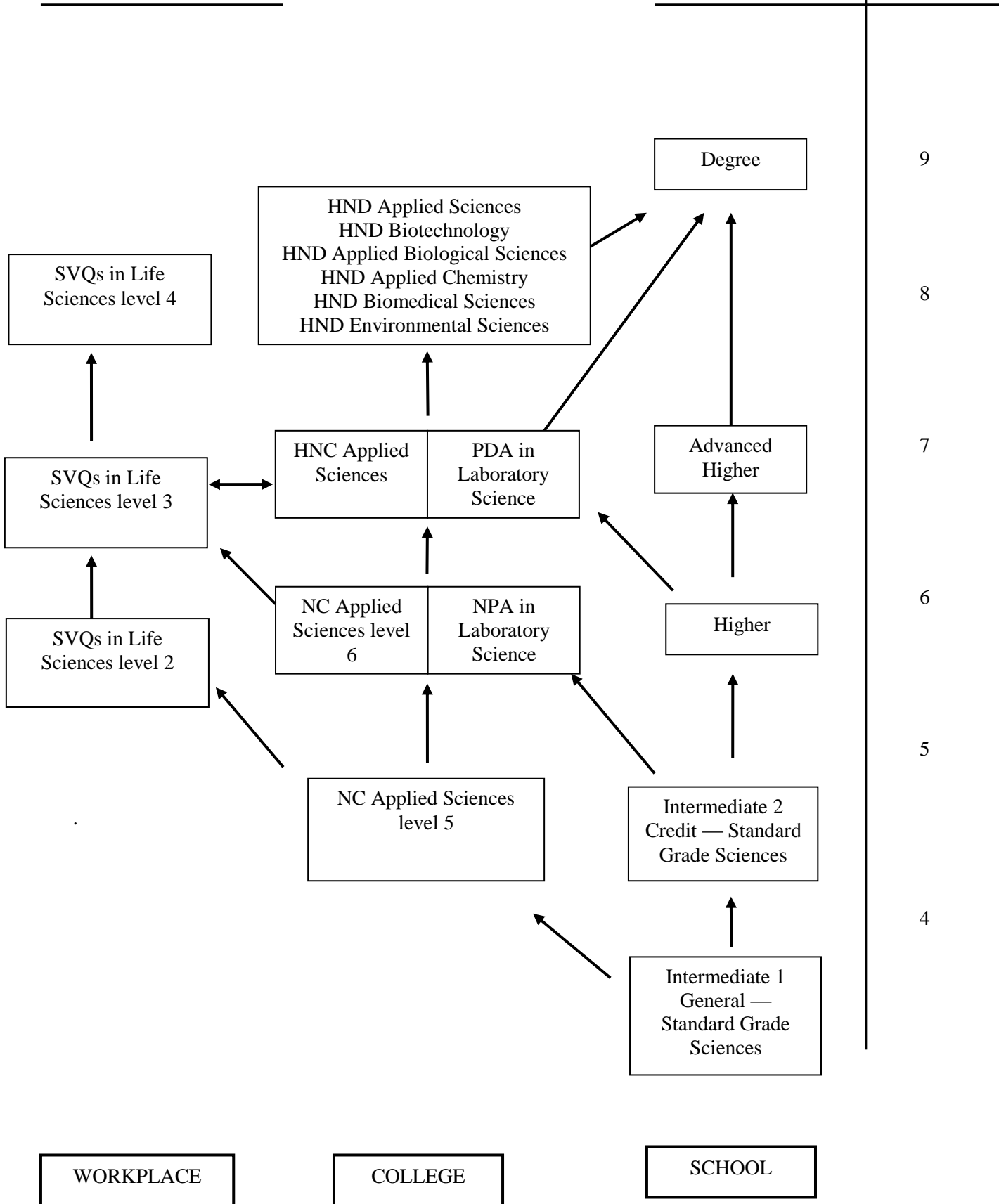
Relationship of this award to existing SQA provision

The NPA in Laboratory Science will feed directly into the PDA Laboratory Science enabling career and educational progression. The PDA in Laboratory Science is largely based on Units within the HNC/HND Science Frameworks. Successful NPA/PDA candidates will therefore be able to work to progress to HNC and/or HND awards.

FIGURE 1

PROGRESSION CHART

SCQF levels



6 Approaches to delivery and assessment

6.1 Content and context

The NPA Laboratory Science is a specialised award which allows candidates to gain knowledge and technical skills in quality issues, microbiology, chemistry, quantitative skills and other science areas. As such, it is intended to prepare candidates for employment at technician or technologist level in science laboratories. Moreover, the NPA supports the Life Sciences level 2 Modern Apprenticeship.

The award develops clear career and education pathways for learners including a range of study options in higher education, particularly in the field of science.

6.2 Delivery and assessment

Although centres can choose the order in which to teach the Units within the award, it is advised mandatory Units are delivered initially as these support optional Units. Moreover, where candidates are taking bridging Units these should also be delivered in the initial period of teaching.

The assessment strategy is designed to encourage a more holistic approach to assessment. The Unit specifications place the emphasis on reducing the assessment load for candidates and centres by specifying assessments which assess the entire theory content of the Unit where appropriate, and by sampling of knowledge and/or skills carried out under closed-book conditions on a random basis to ensure the candidates do not have prior knowledge of the sample.

Unit specifications detail exactly the Evidence Requirements and assessment procedures for each assessment event. Should centres wish to use a different mode of assessment from that recommended, they should seek prior moderation from SQA.

Assessment exemplar material for all recommended year one core Units is available from SQA.

Where appropriate centres can access e-assessment tools for both formative and summative assessment. Many of the Units also can be supported by e-learning.

6.3 Flexible Learning

The NPA could be delivered flexibly in partnership with employers and individuals. Candidates would have to attend the presenting centre or other agreed institution to complete the practical assessments. Centre-devised supervision agreements should detail controlled conditions to ensure authenticity of evidence.

6.4 Credit transfer transition arrangements

In principle, candidates can be given credit transfer between relevant Units previously achieved and new Units.

7 General information for centres

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.

Internal and external verification

All instruments of assessment used within this Group Award 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 and Quality Assurance for Colleges of Further Education* (www.sqa.org.uk).

8 General information for candidates

Centres should provide candidates with a brief summary of the Group Award before they commence on their Course of study. It should include information on what the Group Award is about, and provide information on the knowledge and skills which will be developed, what is involved in assessment and the conditions of the award.

This would normally be presented as part of the information in a Course handbook and should include information on the possible routes of progression in education or types of employment available for candidates obtaining the qualification.

Industries which encompass science are diverse including:

- ◆ Chemicals
- ◆ Oil and gas
- ◆ Life Sciences
- ◆ Health
- ◆ Food and Drink

Employers in these industries have expressed a need for technically competent scientists. This qualification will support those working as laboratory technicians, those who hope to gain employment in a laboratory and also support the Modern Apprenticeship in Life Sciences (level 2).

Learners should have some prior science knowledge at SCQF level 5. The Course content is flexible and supports biological, chemical and environmental science. The NPA articulates directly to the PDA in Laboratory Science and the HNC Applied Sciences.

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a new way of speaking about qualifications and how they inter-relate. We use SCQF terminology 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: One SCQF credit point equates to 10 hours of learning. NQ Units at SCQF levels 2–6 are worth 6 SCQF credit points, NQ Units at level 7 are worth 8 SCQF points.

SCQF levels: The SCQF covers 12 levels of learning. 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.

Dedicated Unit to cover Core Skills: This is a non-subject Unit that is written to cover one or more particular Core Skills.

Embedded Core Skills: This is where the development of a Core Skill is incorporated into the Unit and where the Unit assessment also covers the requirements of Core Skill assessment at a particular level.

Signposted Core Skills: This refers to the opportunities to develop a particular Core Skill at a specified level that lie outwith automatic certification.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the National Certificate/National Progression Award from its inception/revision through to validation. The group is made up of key stakeholders representing the interests of centres, employers, universities and other relevant organisations.

Consortium-devised National Certificates/National Progression Awards are those developments or revisions undertaken by a group of centres in partnership with SQA.

10 Appendices

Appendix 1: Mapping of National Occupational Standards to Units

Appendix 2: Core Skills mapping

Appendix 1: Mapping of National Occupational Standards to Units

Group Award title: NPA Laboratory Science

SVQ: Level 2 Laboratory Science

Unit code	Unit title	National Occupational Standard																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
DF82 34	Quality and Health & Safety Systems in Science Industries	√	√	√	√	√			√	√	√										
DX29 33	Fundamental Chemistry: An Introduction	√	√	√	√						√										
F3T8 11	Mathematics for Science						√	√	√	√	√					√					
D042 12	Microbiological Techniques						√	√	√	√									√	√	√

Underpinning knowledge optional Units also map to the optional VQ Units.

NPA National Occupational Standards

- 1 Maintaining health and safety in a laboratory environment.
- 2 Maintaining effective and efficient working relations.
- 3 Receiving, Sorting, transporting and storing laboratory specimens/samples under supervision.
- 4 Communicating laboratory information to authorised personnel under supervision.
- 5 Accessing, registering and inputting patient data in a LIMS under supervision.
- 6 Assisting with the preparation of biopsy specimens for laboratory investigation.
- 7 Assisting with the preparation of microbiological specimens/samples for laboratory investigation.
- 8 Assisting with the processing of liquid clinical specimens using automated laboratory techniques.
- 9 Assisting with the processing of liquid clinical specimens using manual laboratory techniques.
- 10 Assisting with the maintenance of stocks of reagents and consumables for laboratory use.
- 11 Drawing blood samples from patients for laboratory investigation.
- 12 Assisting with the processing of liquid compounds/samples using automated laboratory equipment.
- 13 Assisting with the processing of liquid compounds/samples using manual laboratory techniques.
- 14 Assisting with the processing of liquid compounds/samples using manual laboratory techniques.
- 15 Assisting with the preparation of solutions for laboratory use.
- 16 Measuring, weighing and preparing compounds and solutions for laboratory use.
- 17 Assisting with the processing of diagnostic cytology specimens in the laboratory.
- 18 Assisting with the routine maintenance, cleaning, disinfecting and calibration of laboratory equipment.
- 19 Preparing culture media and solutions for laboratory use.
- 20 Following aseptic procedures in the laboratory environment.

Appendix 2: Core Skills mapping

Core Skills						
Units		Numeracy	Communication	Information Technology	Problem Solving	Working with others
Acids, Bases and Metals	D068 11					
Animal Physiology	D028 11					
Behaviour, Populations and the Environment	D045 12					
Biology of Micro-organisms	DF5F 11	√ Embedded				
Biotechnology	DF5J 12					
Biotechnology Processes	DF5G 11					
Building Blocks	D066 11					
Carbon Compounds	D067 11					
Cell Biology	D029 12					
Cell Function and Inheritance	D043 12					
Chemical Reactions	D071 12					
Control and Regulation	D031 12					
Electrical Fundamentals	D132 11	√				
Energy Matters	D069 12					
Engineering: Measurement Technology — Pressure/Level	F5KT 12	√			√	
Engineering: Process Control	F5KK 12	√		√	√	
Engineering: Process Control Systems	F5KW 12	√		√	√	√
Environmental Biology and Genetics	D027 11					
Experimental Procedures — Biology	HN89 46					
Experimental Procedures — Chemistry	HN8A 46					
Experimental Procedures — Science	HN8D 46					
Fundamental Chemistry: an Introduction	DX29 33				√	
Genetics and Adaptation	D030 12					
Living Cells	D026 11					

Core Skills						
Units		Numeracy	Communication	Information Technology	Problem Solving	Working with others
Mathematics for Science	F3T8 11	√				
Microbiological Techniques	D042 12					
Microbiology	DF5H 12					
Process Chemistry: an Introduction	F6X9 12	√	√			
Quality and Health and Safety Systems in Science Industries	DF82 34		√			
Radioactivity	D382 11					
Science Investigation Skills	F3TB 11	√	√	√	√	
Systems and Control	D187 11				√ Embedded	
The Continuation of Life	D044 12					
The Human Body	F1RH 11					
The World of Carbon	D070 12					
Waves and Optics	D381 11					
Working with Micro-organisms	D039 11					