

A Foundation Apprenticeship in Scientific Technologies (Laboratory Skills) at SCQF level 6

GN14 46

A large, abstract graphic on the right side of the page. It consists of several overlapping teal-colored rectangular shapes with a white dotted border. The shapes are arranged in a grid-like pattern, with some overlapping others, creating a sense of depth and movement. The overall effect is a modern, geometric design.

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This document provides you with information you will require to deliver a Foundation Apprenticeship in Scientific Technologies.

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Version Control			
Version Number	Revision(s)	Approved by	Date
1.0	New Framework Specification	Frank Quinn	October 2020
1.1	post FA developments Addition of Assessment Arrangements 23/24	Deborah Miller	July 2023

Background

One of the key recommendations of Sir Ian Wood's review on developing the young workforce was to "develop better connectivity and co-operation between education and the world of work to ensure young people at all levels of education understand the expectations of employers, and that employers are properly engaged" (Scottish Government response to "Developing the Young Workforce; 2015). The Scottish Government set ambitious targets to ensure this connectivity is delivered through a partnership of schools, colleges/training providers and employers.

Skills Development Scotland (SDS), alongside other partners, is working with industry to increase the range of work-based learning opportunities for pupils in the senior phase of secondary schools. One of the ways this is being achieved is through the development of Foundation Apprenticeships and SDS is leading this initiative. Foundation Apprenticeships will allow pupils to gain vocational qualifications that combine sector specific skills alongside the knowledge that underpins these skills in a workplace setting while still at school.

The Foundation Apprenticeship in Scientific Technologies is designed to provide Senior Year 5 (S5) and Senior Year 6 (S6) pupils opportunities to develop skills and knowledge for entry into a career in the Science sector. The Foundation Apprenticeship may also contribute directly to the achievement of a Modern Apprenticeship by attainment of core units in an MA qualification.

The Science Industry in Scotland

Life sciences and the related science industries are high-tech, innovative and highly diverse, spanning pharmaceuticals, medical technology, biotechnology, and industrial biotechnology and has applications across many other sectors. Through the development of innovative medicines, medical technologies and services, its businesses contribute to a stronger and fairer society, helping people enjoy better health, well-being and quality of life. Scotland has a thriving Life Sciences and the Related Science Industry Sector which consists of just over 630 organisations. It has an established network of over 40 pharmaceutical clinical trial support and contract research organisations

These organisations employ approximately 32,000 people across the entire main Life Sciences and Related Science sector. These organisations contribute over £2.8 billion to the Scottish Economy annually, with a projected GVA growth rate of 8% which is four times the average rate for Scotland. Life Sciences and the Related Science Industries has been identified as a key sector in the Scottish Governments economic strategy in recognition of its international comparative advantage, high growth potential and capacity to boost productivity – with an aspirational GVA of £3bn by 2020.

Scotland has internationally recognised capabilities across Life Sciences and the Related Science Industries including:

- Drug discovery and development
- Contract research
- Medical technologies
- Stem cell research
- Specialised biomanufacturing
- Bioinformatics

Scotland is home to one of the largest concentrations of Pharmaceutical support networks in Europe, with more than 40 organisations working on clinical and non-clinical research. Historically,

Life Sciences Scotland has focused mainly on the healthcare aspect but increasingly there are opportunities for the capacity and capability to be expanded to industrial, marine, plant, environmental and veterinary biotechnology (hence the term Related Science Industries).

Scotland also has a particularly strong reputation in the medical arena, for example:

- Cancer and cardiovascular research
- Neuroscience
- Genomics
- Proteomics and bioinformatics
- Stem cell research and regenerative technology
- Virology and immunology

The Scottish Life Sciences and the Related Science Industries is not only highly innovative and dynamic but it is also one of the most highly regulated sectors and faces increased scrutiny from regulators and increasing pricing pressures. The shape and size of industry has been changing over the last few years with large pharmaceutical companies becoming fewer and with Clinical Research Organisations, SMEs and microbusinesses forming the larger part of the Sector.

Since 2010 there have been over 100 new regulations implemented or amended. NHS and industry are increasing aligning to each other and need to understand each other's key challenges. For the Life Science Industries and the Related Science Industries to be sustainable it is more important than ever to increase profit margins, keep up to date with the latest technologies, deliver products that are value for money and having a flexible work force that can adapt and learn new skills, whilst maintaining standards and adhering to regulations. The larger organisations are re-structuring to mirror the successful SME structures. This type of set-up requires a different skill set, which includes broader and more innovative skill set than traditionally required.

In Scotland, there are over 7,500 roles at the Laboratory Assistant/ Technician trainee/ Trainee Scientist/Technician/Scientist/Technologist level within Life Sciences related operations. These roles span across industry, universities, schools, further education colleges and NHS. There are many different types of work employees in these roles carry out from sampling and preparing samples through to testing. When taking into account market growth and retirements in the sector, there will be a significant net requirement within each of these areas. Additionally, there are currently challenges in getting the right people with the right skills.

Why choose a career in the Science Industries?

- People with STEM (Science, Technology, Engineering and Mathematics) qualifications are in high demand from employers. By achieving good qualifications in STEM subjects, you will put yourself in a strong position in the jobs market.
- There are a huge variety of exciting careers available.
- Amongst organisations needing people with STEM knowledge and skills, 43% have reported difficulties recruiting staff, hence there is a great demand for more young workers with STEM skills and qualifications.
- There is an ageing population of workers in the science industries, meaning there is a high replacement demand.
- Estimates show that the UK science industry has a shortfall of around 40,000 new workers each year, resulting in great job security.
- On average, those working in STEM occupations earn 20% more than those working in other fields.

What is the Foundation Apprenticeship in Scientific Technologies?

The Foundation Apprenticeship (FA) in Scientific Technologies is for pupils in S5 and S6 and typically takes 2 years to complete. Increasingly the framework is also available over a shorter duration, typically a single academic year.

Irrespective of the delivery model, the Scientific Technologies framework includes two core elements, namely:

1. National Progression Award in Scientific Technologies
2. Work Based Learning units

The full programme specification is outlined further in this document.

Background / rationale

This Foundation Apprenticeship supports the commitment to provide relevant work-based vocational education and training as part of the senior phase curriculum. This will prepare young people for direct entry into a career in the Science sector by equipping them with the necessary skills and knowledge to work effectively from day one of employment. This includes both the development of practical and technical skills alongside the development of learner meta-skills, supported via project-based learning. It also highlights meaningful vocational pathways as challenging and valuable alternatives to existing academic subjects.

Partnership

A Foundation Apprenticeship is about the right balance between delivering the taught elements of the programme (the NPA) and the development of work-based competences the meta-skills and work-based learning elements.

Development of true competence depends on the continuing acquisition and application of underpinning skills and knowledge. Young people need to build real workplace skills including both those that are specialist to the chosen career and the generic behaviours and attributes that apply to any workplace. This is achieved in a real work setting involving meaningful activities introduced throughout the programme.

Foundation Apprenticeships are delivered by partnerships comprised of school, learning provider and employer. The learning provider is responsible for the approvals, delivery, assessment and quality assurance of the component units and qualifications. Where multiple learning providers are involved, arrangements between them will be detailed in an SQA Partnership Agreement.

The learning provider must have the appropriate SQA centre and qualification approvals in place before it can deliver the Foundation Apprenticeship.

Partnership

For further support and guidance on SQA's approval, quality assurance processes and SQA Partnership Agreements, please see:

<https://www.sqa.org.uk/sqa/101347.html>

Employers are an essential part of the partnership and can contribute in a range of ways, from creating a workplace challenge, to coaching and mentoring, to interviewing and selection. They may also be involved in the assessment of the work-based learning element.

Pastoral Care

The young people embarking on this Foundation Apprenticeship are school pupils and therefore all those involved in delivering the programme have a duty of care. This includes providing appropriate health and safety training and measures to ensure the safety of the young people, including relevant safeguarding requirements that are required by respective Local Authority and School partners. This must be in the context of the specific workplaces of the individual pupils (one of the mandatory units of the FA covers health and safety).

In addition, a workplace mentor must be assigned to be a point of contact for the young person when they are not in the school environment.

Work placement allocation and methodology, whether on-site or through remote working, should take cognisance of the learner's personal circumstances to maximise the learner experience and opportunity.

How should the Foundation Apprenticeship in Scientific Technologies be delivered?

Often, delivery and assessment of the relevant NPA occurs at the start of the programme so that the underpinning knowledge can be obtained before contextualising within the work-based learning element.

The work-based learning units are designed to support the contextualisation of the National Progression Award, and therefore should be seen as a complementary unit to run concurrent with the NPA.

The work-based learning element is designed to offer the learner access to the workplace, either physically onsite or through remote working. Learning providers are required to identify host employer(s) to provide the work placement opportunity. Employer(s) are asked to provide real work activity aligned to the organisations objectives and to support the development of evidence for assessment against the outcomes

Involvement of industry is encouraged across the entire programme of learning. Learner success is best reflected when the delivery of the theory and practical elements are aligned. This approach maximises the contextualisation for the learner and offers the opportunity to put into practice underpinning learning.

Work Based learning Element:

The Scientific Technologies FA contains units aligned to the respective modern apprenticeship programme. Providers are encouraged to utilise the SVQ route where physical access to the workplace remains and assess in accordance to the SVQ assessment standards required for external verification. Where not possible, providers may utilise the corresponding customised unit. This reflects the same content and standards underpinned by the NOS however offers greater flexibility to the methods of deliver and assessment where access to the physical workplace is not available.

Please refer to the Foundation Apprenticeship Product Specification for further information on the principles of Foundation Apprenticeship delivery.

Please refer to Annex 1 at the end of this document for a detailed breakdown of the units and codes within the framework

Certification

SQA will issue the commemorative certificate for the Foundation Apprenticeship.

Learning providers must ensure that they have appropriate approvals in place with SQA for the Foundation Apprenticeship and all mandatory components. Candidates must be entered and resulted for all relevant units for verification and certification purposes.

Once all contributing results are entered on SQA systems, the candidate's commemorative certificate will be produced.

SQA Awarding Body quality assurance requirements apply to the delivery of the SQA component units and group awards. Centres are required to sign up to the relevant Assessment Strategy for the SVQ and comply with all its requirements.

Scientific Technologies placements for the Foundation Apprenticeship

Ideally, pupils will have the opportunity of 2 placements. The placements must be with science employers and not a simulated placement like a school or college laboratory.

Learner Selection and Entry Requirements

The Foundation Apprenticeship in Scientific Technologies is aimed at pupils with an interest and enthusiasm in exploring this area of work. Although set at SCQF L6, due to the contextualised learning experience where underpinning theory and practice are aligned with industry, learners operating at SCQF L5 or above on arrival are encouraged.

Equalities

We expect those involved in the development, recruitment and delivery of Foundation Apprenticeships to be pro-active in ensuring that no-one should be denied opportunities because of their age, disability, gender reassignment, marriage and civil partnership, religion or belief, sex or sexual orientation or pregnancy and that any barriers (real or perceived) are addressed to support all pupils. These are the protected characteristics of the Equality Act 2010 and training providers and employers must comply with this Act to ensure that applicants are not discriminated against in terms of entry to and promotion within the industry.

Our emphasis throughout is upon equality and diversity both for new entrants to the sector and opportunities for progression for the existing workforce.

Learner Progression

Foundation Apprenticeships are directly aligned to three primary progression pathways. These are:

- Modern Apprenticeship
- Further Education
- Higher Education

A pupil completing the Foundation Apprenticeship in Scientific Technologies will have achieved a large proportion of the requirements for a Modern Apprenticeship in Life Science and Related Science Industries at SCQF level 6

Further Education:

All Scottish further education colleges recognise the Foundation Apprenticeship Scientific Technologies as an eligible qualification towards Higher National provision, alongside other qualifications.

Higher Education:

Scottish universities recognise the Foundation Apprenticeship in Scientific Technologies as an eligible qualification towards under-graduate degrees and graduate apprenticeship provision, alongside other qualifications.

For more information on careers in the Science Industries please go to:

<http://www.cogentskills.com/careers/>

Recognition of Prior Learning

SQA's policy is to recognise prior learning as a method of assessing whether a learner's experience and achievements meet the evidence requirements (i.e. the standard) of a SQA Unit or Units and which may or may not have been developed through a course of learning.

More information can be found on the [SQA website](#).

Foundation Apprenticeships – assessment arrangements 2023-24

SQA and SDS can confirm the following arrangements for the delivery and assessment of Foundation Apprenticeships (FAs) in session 2023–24 only.

FA Learners completing in session 2023-24

Now that Covid-19 restrictions have been removed, centres are urged wherever possible to ensure all learners undertaking a Foundation Apprenticeship are assessed in a workplace in line with the original frameworks.

However, to minimise disruption for existing learners and centres, the following arrangements will be in place for learners completing a Foundation Apprenticeship in 2023-24 only:

- Learners starting a Foundation Apprenticeship in June 2023 who will complete in a **single year**, or current learners who are already entered on a two-year delivery model, can either:
 - use optional Customised units or pathways if required, or
 - use the original framework.

These are one-year arrangements that will be closely monitored.

Centres must ensure that they are approved by SQA to deliver the appropriate Foundation Apprenticeship prior to commencing delivery and that all these learners are entered for all Customised components of their Foundation Apprenticeship by **1 December 2023**. No entries should be made for learners on these arrangements after that date.

This will ensure these learners can be certificated by December 2024 at the latest.

SQA will remove all Customised units and Customised pathways from Foundation Apprenticeship frameworks in December 2024 without exception. These only apply for session 2023-24 and new arrangements will be announced in due course for session 2024-25.

FA Learners completing in 2024-25

The arrangements detailed above **do not apply** to learners who are starting a Foundation Apprenticeship in 2023-24 on a two-year delivery model.

Any learner beginning their Foundation Apprenticeship on a **two-year delivery model** – completing in 2024-25 – must use the original Foundation Apprenticeship framework and accordingly, learn and be assessed in a workplace.

Foundation Apprenticeships Framework Specification: Scientific Technologies at SCQF Level 6

GN14 46 Foundation Apprenticeship in Scientific Technologies			
Group Award Title	Unit Title	SCQF Level	SCQF Credits
GN13 46 NPA in Scientific Technologies (SCQF level 6)	F3TD 11 Laboratory Safety	5	6
	HP9W 45 Mathematics for Science 2	5	6
	HT6V 46 Fundamental Chemistry: An Introduction	6	6
	HN8D 46 Experimental Procedures: Science	6	6
Work Based Learning (GP45 23) SVQ in Laboratory and Associated Technical Activities (Industrial Science)	J1J0 04 Follow Health and Safety Procedures for Scientific or Technical Activities OR Customised unit - J4F1 04 Follow Health and Safety Procedures for Scientific or Technical Activities	5	6
	J1GX 04 Carry Out Simple Scientific or Technical Tests Using Manual Equipment OR Customised unit - J4F3 04 Carry Out Simple Scientific or Technical Tests Using Manual Equipment	6	7
	J1JN 04 Prepare Compounds and Solutions for Scientific or Technical Use OR Customised unit - J4F2 04 Prepare Compounds and Solutions for Scientific or Technical Use	7	15
Foundation Apprenticeship Certification Unit	HE6E 04 Foundation Apprenticeship Certification Unit	-	0
TOTAL SCQF CREDIT POINTS			52
Please Note: SVQ units belonging to the finished SVQ are not displayed in this view of the Foundation Apprenticeship: Scientific Technologies. These units are still visible on navigator. Any new candidates should be entered on the SVQ units shown in this table.			

One SCQF credit point is equivalent to ten (10) notional hours of learning.

Learners starting a Foundation Apprenticeship in June 2023 who will complete in a **single year**, or current learners who are already entered on a two-year delivery model, can use optional Customised units or pathways if required. All these learners must be entered for all Customised components of their Foundation Apprenticeship by **1 December 2023**. No entries should be made for learners on these arrangements after that date.

SQA will remove all Customised units and Customised pathways from Foundation Apprenticeship frameworks in December 2024 without exception.

Any learner beginning their Foundation Apprenticeship on a **two-year delivery model** – completing in 2024-25 – **must use the original Foundation Apprenticeship framework** and accordingly, learn and be assessed in a workplace.