



Semta

Science SVQs

Assessment Strategy

Laboratory and Associated Technical Activities

Table of Contents

Introduction	3
Scope of the Qualification	4
Qualification Structure	4
Assessor Requirements	5
Verifier Requirements	5
Technical Requirements for Assessors and Verifiers	6
Assessment Environment	7
Access to Assessment	7
Carrying out Assessments	7
Assessing Knowledge and Understanding	8
Witness Testimony	8
SEMTA External Quality Control of Assessment	9
ANNEX 1	10

ASSESSMENT STRATEGY for SCIENCE SVQs

Introduction

[SEMTA], the Standards Setting Body for the Science Engineering Manufacturing Technologies sector, has taken into account the Scottish Qualifications Authority (SQA) Accreditation's Awarding Body criteria (2007) in producing this Assessment Strategy

[SEMTA] has produced this guidance to:

- Assist assessors, internal verifiers and external verifiers
- Encourage and promote consistent assessment of this qualification and/or units.
- Promote cost effective assessment plans.

This guidance provides definitions for:

- The qualifications and experience required for Assessors and Verifiers
- The assessment environment and notes on simulation / replication
- Access to these qualification/units.

And suggestions for:

- Carrying out assessments
- Performance evidence requirements
- Assessing knowledge and understanding
- The arrangements for 'external quality control of assessment.

The importance which employers and candidates place on having this qualification will provide a key measure of [SEMTA's] success with this assessment strategy. Another key success factor will be [SEMTA's] partnership with the relevant Awarding Bodies.

[SEMTA] will use the following guidance to continually improve its strategies for assessment for part or whole qualifications.

ASSESSMENT STRATEGY for SCIENCE SVQs

Scope of the Qualification

Evidence of competence must be assessed against the requirements of the relevant National Occupational Standards.

The Science SVQs have been designed to cover those candidates who:

- Require a broad range of competencies to enable the safe and controlled entry into the workplace by undertaking a Science based Apprenticeship Framework.
- Are in employment but require additional competencies as part of an existing job role or to enable career progression which involves the application of skills, knowledge and understanding in a range of work activities often performed in a variety of contexts.

Employees with proven work experience/competence but have no formal qualifications

Qualification Structure

The qualification structure may require candidates to complete common mandatory units, followed by a choice of pathways. Candidates may then be required to complete further mandatory units within their chosen pathway, followed by a number of optional units from a provided selection. The range of optional units allows for any variations in the occupation in different organisations and across the sector.

The number of mandatory and optional units required to achieve this qualification, and the available pathways, is defined in the specific qualification structure. This outlines the minimum number of units that must be taken, but additional units can be taken to suit the requirements of particular organisations.

ASSESSMENT STRATEGY for SCIENCE SVQs

Assessor Requirements

Assessment must be carried out by competent assessors who hold, or are working towards, the nationally recognised Assessor units A1 and/or A2 as appropriate to the assessment being carried out. Assessors that hold units D32 and/or D33 must demonstrate that they are applying the assessment principles and practices set down in A1 and/or A2 as appropriate to the assessment being carried out.

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge evidence for this qualification. This will be demonstrated either by holding a relevant technical qualification or by proven workplace experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the candidate(s) in the units being assessed.

Assessors must also know:

- The content and meaning of the National Occupational Standards against which assessments are to be carried out
- SQA Regulatory System for vocational qualifications
- The relevant Awarding Body's documentation and system of vocational qualifications within which the assessment is taking place.

Verifier Requirements

Internal verifiers must hold, or be working towards, the nationally recognised Internal Verifier unit V1 and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units. Internal Verifiers that hold unit D34 must demonstrate that they are applying the verification principles and practices set down in V1.

External verifiers must hold, or be working towards, the nationally recognised External Verifier unit V2 and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units, and possibly even the nationally recognised Internal Verifier unit. External Verifiers that hold unit D35 must demonstrate that they are applying the verification principles and practices set down in V2

Verifiers, both internal and external, will also be expected to be fully conversant with the terminology in the National Occupational Standards against which the assessments and verification are to be carried out, SQA Regulatory Body's system of vocational qualifications, and the relevant Awarding Body's documentation and system of vocational qualifications within which the assessment and verification is taking place.

Specific technical requirements for internal and external verifiers

Internal and external Verifiers of this qualification and/or units must be able to demonstrate that they have verifiable, sufficient and relevant experience, and must have a working knowledge of the processes, techniques and procedures that are used in Scientific/Laboratory organisations.

The tables on the following page show the recommended levels of technical competence for assessors, internal verifiers, and external verifiers.

ASSESSMENT STRATEGY for SCIENCE SVQs

Technical Requirements for Assessors and Verifiers

Position	Prime activity requirements	Support activity requirements	Technical requirements (see notes)
Assessor	Assessment Skills	IV Systems	Technical <i>competence</i> in the areas covered by the qualifications being assessed
Internal Verifier	Verification Skills	Assessment Knowledge	Technical <i>understanding</i> of the areas covered by the qualifications
External Verifier	Verification skills	Assessment Understanding	Technical <i>awareness</i> of the areas covered by the qualifications

Notes

1. Technical *competence* is defined here as a combination of practical skills, knowledge, and the ability to apply both of these, in familiar and new situations, within a real working environment.
2. Technical *understanding* is defined here as having a good understanding of the technical activities being assessed, together with knowledge of relevant Health & Safety implications and requirements of the assessments.
3. Technical *awareness* is defined here as a general overview of the subject area, sufficient to ensure that assessment and portfolio evidence are reliable, and that relevant Health and Safety requirements have been complied with.
4. The competence required by the assessor, internal verifier and external verifier, in the occupational area being assessed, is likely to exist at three levels as indicated by the shaded zones in the following table.

Technical Competence required by:	An ability to <i>discuss</i> the general principles of the competences being assessed	An ability to <i>describe</i> the practical aspects of the competence being assessed	An ability to <i>demonstrate</i> the practical competences being assessed
Assessor			
Internal Verifier			
External Verifier			

ASSESSMENT STRATEGY for SCIENCE SVQs

Assessment Environment

The evidence put forward for this qualification and/or units can only be regarded valid, reliable, sufficient and authentic if demonstrated in the working environment. Evidence put forward for assessment must be obtained from the working environment and is clearly attributable to the candidate. However, in certain circumstances, simulation/replication of work activities may be acceptable.

Where simulation/replication is considered necessary, assessors must be confident that the environment simulates/replicates the workplace to such an extent that competencies gained will be fully transferable to the workplace. In this case assessors must clearly identify those aspects of the workplace that are critical to performance, and make sure that they have been replicated satisfactorily. Where simulation/replication is involved, assessors must obtain agreement with internal and external verifiers before assessing any candidates.

Examples of critical aspects could be:

- Health, safety and environmental conditions such as, noise levels, lighting conditions and the presence of hazards
- The use of workplace scientific or technical equipment
- Quality standards to be achieved
- Processes and procedures
- Pressure of work such as time constraints and repetitive activities
- Carrying out processes on actual work pieces and the consequences of making mistakes
- Customer/supplier/departmental relationships

Simulations/replications should be designed in relation to a realistic work environment, having an acceptable level of appropriate equipment and operating to workplace scientific or technical standards. It may involve the use of inert substitutes for dangerous compounds or microbiological materials.

Access to Assessment

There are no entry qualifications or age limits required for these qualifications and /or units unless this is a legal requirement of the process or the environment. Assessment is open to any candidate who has the potential to reach the standards laid down for this qualification and/or units.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

Carrying Out Assessments

[SEMTA] strongly recommends that the majority of assessment evidence for the mandatory units is gathered during the performance of the optional units. Evidence should be obtained as a whole, where practically possible, since competent performance in the optional units is often dependent on competence in the mandatory units. Although it is possible to achieve this qualification with the minimum number of optional units, organisations may wish their candidates to be assessed for more than this.

The National Occupational Standards were developed to cover a range of activities. The evidence produced for this qualification and/or units will, therefore, depend on the candidate's choice of 'scope' items in the standard, which are intended to help the candidate to seek the appropriate information and to acquire the necessary skills, techniques and knowledge before being able to demonstrate competent performance.

ASSESSMENT STRATEGY for SCIENCE SVQs

Where the scope section gives a choice (for example 'any three from five'), assessors should note that candidates do not need to cover the other (in this example, two) items, particularly where these additional items may relate to other activities or methods that are not part of the candidate's normal workplace activity or area of expertise.

Assessing Knowledge and Understanding

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the candidate's knowledge and understanding (and the handling of contingency situations) is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways, but it is suggested that the most appropriate methods for this qualification are oral questioning and practical demonstrations. Assessors should ask enough questions to be able to determine that the candidate has an appropriate level of knowledge and understanding as required by the unit.

Evidence of knowledge and understanding will **not** be required for those scope items that have not been selected by the candidate.

The achievement of the specific knowledge and understanding requirements of the standards cannot simply be inferred by the results of tests or assignments from other qualifications or training programmes. Where evidence is submitted from these sources, the assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the candidate, and meets the full knowledge and understanding requirements of the standard.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the candidate's answers.

Awarding Bodies may choose other methods, which must be supported by a suitable rationale.

Witness Testimony

Where 'observation of the process' is used to obtain the performance evidence this must be carried out against the National Occupational Standards. Best practice would require that such observation is carried out by a qualified Assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the standards by someone else in close contact with the candidate. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the candidate's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the candidate. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of a candidate's competency are reliable and technically valid.

SEMTA External Quality Control of Assessment

General

There are two major points where an Awarding Body interacts with the Centre in relation to the External Quality Control of Assessment for a qualification and these are:

- Approval - when a Centre take on new qualifications, the Awarding Body, normally through an External Verifier (EV) ensures that the Centre is suitably equipped and prepared to deliver the new qualification
- Monitoring - throughout the ongoing delivery of the qualification the Awarding Body, through EV monitoring and other mechanisms must maintain and the quality and consistency of assessment of the qualification

Approval

In granting Approval, the Awarding Body, normally through its External Verifiers (EV), must ensure that the prospective Centre:

- Meets the requirements of SQA Accreditation, e.g. the Awarding Body Criteria
- Has sufficient and appropriate physical and staff resources
- Meets relevant health and safety and/or equality and access requirements
- Has a robust plan for the delivery of the qualification

Depending on an assessment of the condition of the Centre by the Awarding Body this may require a visit to the Centre to view evidence or may be undertaken through other means. The Awarding Body must have a clear rationale for the method(s) deployed

Monitoring

The Awarding Body, through EV monitoring and other mechanisms must ensure that:

- A strategy is developed and deployed for the ongoing Awarding Body monitoring of the Centre. This strategy must be based on an active risk assessment of the Centre. In particular the strategy must identify the candidate, assessor and IV sampling strategy to be deployed and the rationale behind this
- The Centre's internal quality assurance processes are effective in candidate assessment
- Sanctions are applied to a Centre where necessary and that corrective actions are taken by the Centre and monitored by the Awarding Body/EV
- Reviews of Awarding Body external auditing arrangements are undertaken

Awarding Bodies are required to provide to SEMTA, on request, details of the strategies, rationales and reviews detailed above.

ANNEX 1

Assessment Guidance

Performance Evidence Requirements

Performance evidence must be the main form of evidence gathered.

In order to demonstrate consistent, competent performance for a unit, a minimum of **three** different examples of performance must be provided, and must be sufficient to show that the performance requirements of the unit have been carried out to the prescribed standards. The minimum number of items specified in each of the scope statements for a unit (e.g., four from a choice of six) must **all** be covered, and appropriate evidence provided. It is possible that some of the scope items may be covered more than once. If, however, the three examples of performance evidence are not sufficient to cover all the specified scope items, then further examples of performance evidence will be required to ensure this coverage is achieved.

The most effective way of assessing competence, especially for the performance statements in relation to scope items, is through direct observation of the candidate. Assessors must make sure that the evidence provided reflects the candidate's competence and not just the achievement of a training programme.

Evidence that has been produced from team/group activities is only valid when it clearly relates to a candidate's specific and **individual** contribution to the activity, and not to the general outcome(s).

Items of performance evidence often contain features that apply to more than one unit, and can be used as evidence in any unit where appropriate.

Performance evidence must be a combination of:

- The output of the candidate's work, such as products that have been processed or worked on, and documents produced as part of a work activity

Together with:

- Evidence of the way the candidates carried out the activities such as witness testimonies, assessor observations or authenticated candidate reports, records or photographs of the work/activity carried out, etc.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units contain statements that require the candidate to provide evidence that proves they are capable of combining the various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and will not, therefore, be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes suitable evidence, the external verifier should be consulted.