



Life Sciences and Industrial Science Apprentices Assessment Plan

Science Manufacturing Technician

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Foreword

This assessment plan for the Life Science and Industrial Science apprenticeship standard for *Science Manufacturing Technician* has been the subject of extensive consultation and designed with input from industry experts who have many years of experience working in the sector. The Science Industry Trailblazer group, which I have the pleasure to Chair, includes employers from chemical, primary and secondary pharmaceutical, biotechnology, formulated products, steel-making and nuclear manufacturing. We have worked alongside colleagues from the professional bodies and Cogent Skills.

Whatever the nature of the organisation, the competence of its people is critical to achieving business aims. This is why our apprenticeship programmes must produce people who are able to work to the industry standard and contribute to their business from day one.

The assessment plan will ensure that all science industry apprentices have demonstrated that they have the skills, knowledge understanding and behaviours needed to work in this exciting industry.

Craig Hargreaves

SABIC UK Petrochemicals Limited - Chair, Life Sciences & Industrial Science Trailblazer

Introduction

The Life Sciences & Industrial Science Apprenticeships Trailblazer (LS&IS) is employer led through the Science Industry Partnership (SIP).

The assessment plan describes how mandatory end assessment will work for science industry apprenticeships. It focusses on the apprenticeship standard for:

Science Manufacturing Technician

The document is for training providers, independent assessment bodies, apprentices and employers who need to understand how an apprentice being trained for this occupation should be assessed at the end of their training.

This document does not cover the training input and on-going competence evaluation carried out by the employer or their nominated training providers, which is not part of the mandatory end assessment.

Note for clarification:

The term assessment is used in this document to describe activities associated with assessment for the apprenticeship award.

The term competence evaluation is used to describe activities associated with review of an apprentice's competence by an employer or their nominated training provider.

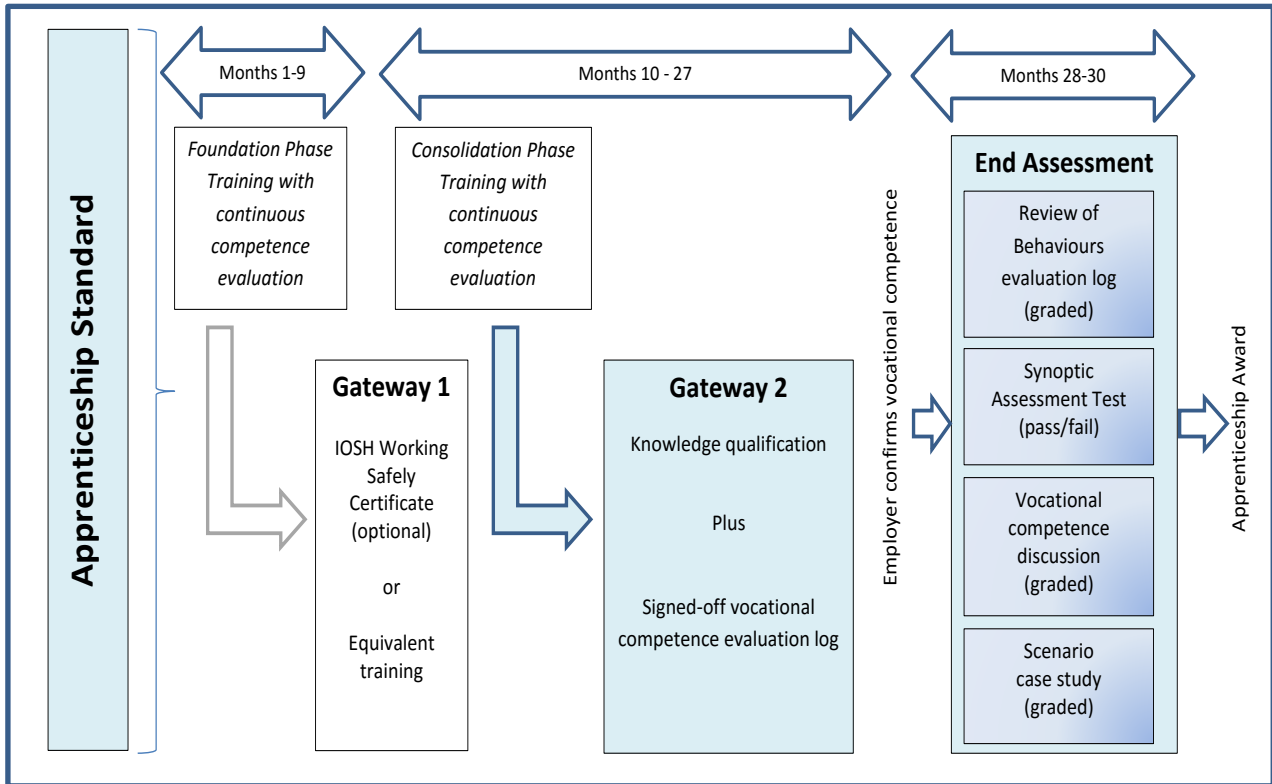
The term employer is used to refer to the host employer, which is the company where the apprentice gains their competency experience. It does not refer to the organisation such as an ATA that has the employment contract with the apprentice.

The term registered assessor is used to describe an individual nominated by the employer that meets the assessor standards set by the Trailblazer group.

The term external assurer is used to describe an individual working for the assessment organisation that meets the assessor standards set by the Trailblazer group.

1. A Summary of Life Sciences & Industrial Science Apprentices Assessment

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There are two suggested phases of training. The Foundation Phase, which is typically months 1 -9, will focus on developing the apprentice's core skills, knowledge and behaviours, specifically around working safely, complying with internal and external regulations and following quality procedures. This training may take place in the workplace or in a largely simulated working environment. It will culminate in Gateway 1, a review of skills by suitably qualified and experienced personnel from the employer or their nominated training partner that will provide assurance that the apprentice has the understanding of the principles of working safely whilst following quality systems within a regulated environment. Whilst specific qualifications are not mandatory, evidence of completion of this gateway is confirmed in a log that is a record of their continuous competence evaluation. Completion of this log will be a pre-requisite for participation in the formal end assessment.

The Consolidation Phase, which is typically months 10 - 27, will focus on developing further skills capability supported by further guided learning, enabling the apprentice to eventually work effectively and independently with minimum supervision. The apprentice will work towards a qualification recognised by a professional body as suitable for registration for RsciTech or EngTech. Achievement of this qualification will also be a pre-requisite for participation in the formal end assessment. At the end of the Consolidation Phase the apprentice will have completed their training and through ongoing competence evaluation, including behaviours evaluation, they will have generated a range of evidence to show they meet the apprenticeship standard. A suitably qualified and experienced assessor from the employer will sign off a log that is a record of their continuous competence evaluation to show they are

ready for the formal end assessment. This assessor must be approved by the assessment organisation as meeting the required assessor standards.

Formal end assessment completed in the final 3 months will be based on a synoptic assessment test (SAT) in the workplace when the approved assessor will observe the apprentice on the job to ensure that the apprentice fulfils the SAT specification. An external assurer from the assessment organisation will observe part of the SAT and then lead a vocational competence discussion that may cover the whole of the apprenticeship standard. The apprentice will also complete a scenario case study designed to test understanding of transferrable skills and application of knowledge that would be required for them to adapt quickly and function effectively after minimal instruction on new equipment / environments or under revised working practices.

The apprenticeship award will be achieved on passing all elements of the formal end assessment. The apprenticeship is graded 'fail', 'pass' and 'distinction.'

Work-based learning guides

The LS&IS Trailblazer employers have developed a work based learning guide that describes the detailed competence sets that underpin each element of the apprenticeship standard. Based on national occupational standards, the work based learning guide provides a detailed specification of the level of skills, knowledge and behaviours required to achieve occupational competence in the development phase of the apprenticeship.

Behaviours evaluation matrix

The LS&IS Trailblazer employers have developed a behaviours evaluation matrix that describes the assessment criteria that should be used by employers to determine whether the apprentice meets the required standard. It also indicates the behaviours that would contribute to achieving a distinction for the apprenticeship award. The behaviours evaluation matrix is included in the work based learning guide.

It is recommended that an apprenticeship training plan is mapped to the work based learning guide and the behaviours evaluation matrix for the apprenticeship standard.

The work based learning guide is available alongside the standard and this assessment plan at www.siasuk.com

2 LS & IS Apprenticeship Standards Assessment Model

The apprentice will be assessed at several stages during their apprenticeship. As well as the assessment/examination that is required for the knowledge qualification, there should be on-going competence evaluation during an apprentice's training programme that will be marked by two gateways, commonly taking place at the end of the first third and at the end of their training programme.

The formal end assessment will include:

- Review of behaviours evaluation log
- A synoptic assessment test
- A vocational competence discussion
- Scenario case study

Taken together, the four assessment instruments will cover all elements of the apprenticeship standard and will lead to the graded apprenticeship award.

3 LS & IS Apprenticeship Standards Assessment Process and Assessment Instruments

The assessment instruments and the assessment process are described in more detail below:

3.1 Gateway 1

Trailblazer employers have stipulated this gateway to provide assurance that the apprentice has demonstrated that they understand the principles of working safely. For new entrants to these safety critical industries and particularly young people, this will provide the necessary foundation on which to embed the skills they will need to be able to work safely under supervision whilst following quality systems within a regulated environment.

To demonstrate this gateway has been completed the employer may choose to use the IOSH working safely certificate or an equivalent course or internal training appropriate to their organisation. Completion of Gateway 1 will be recorded in the competence evaluation log.

3.2 Gateway 2

By Gateway 2 the apprentice must have completed a specified qualification, a vocational competence evaluation log and a behaviours evaluation log.

3.2.1 Qualification

The apprentice must complete a qualification that is recognised for RSciTech or Eng Tech, whichever is relevant to the occupation.

The qualification must be at level 3 or higher and provide the theoretical knowledge needed for the apprenticeship standard. For example:

- BTEC Level 3 Diploma in Applied Science (QCF)
- BTEC Level 3 Extended Diploma in Applied Science (QCF)
- BTEC Level 3 Subsidiary Diploma in Applied Science (QCF)

- BTEC Level 4 HNC Diploma in Applied Chemistry (QCF)
- BTEC Level 4 HNC Diploma in Applied Biology (QCF)
- BTEC Level 3 Diploma in Operations and Maintenance Engineering (QCF)
- BTEC Level 3 Diploma in Manufacturing Engineering (QCF)
- Level 3 Diploma in Process Technology (QCF)
- Level 3 Certificate in Laboratory Technical Skills (QCF)

A range of qualifications may be used to fulfil the requirement for the knowledge component of the apprenticeship standard. This allows employers the flexibility to tailor the apprenticeship to meet their specific local needs, whilst meeting the minimum requirements of the apprenticeship standard.

The application of theoretical knowledge will be tested during the formal end assessment. Therefore the apprentice must have completed the qualification before the end assessment occurs. The qualification will not contribute to the grading of the apprenticeship award.

3.2.2 Vocational competence evaluation log

By the end of the apprenticeship a record of competence evaluation should be captured in a log. This log will be a summary record of in-programme evaluation of competence against the work based learning guide. It is through this process that the apprentice is able to demonstrate competence against the whole apprenticeship standard. This reflects the industry practice of competence management through on-going employer competence evaluation.

The vocational competence evaluation log will provide the overview detail of what evidence was used to confirm the apprentice has demonstrated competence and how it was internally evaluated. All aspects of the apprenticeship standard must be covered. The type of evidence and the internal evaluation process should be recorded. Assessment organisations will provide guidance on what format the log might take.

As part of formal end assessment, a registered assessor from the employer that meets the required assessor standards (section 4) must review and sign-off the completed vocational competence evaluation log. Where the employer is unable to meet these requirements and provide an assessor, an external assessor that meets the required assessor standards may be used.

During the formal end assessment (section 3.3), the apprentice will have the opportunity to present evidence generated during the competence evaluation process to support the assessment of the whole standard. The competence evaluation log will provide a record of where and when that evidence was generated and can provide a reference to where the evidence is held. Typical evidence may include, for example, an NVQ portfolio, a company workbook, performance review record, or certificate of training.

The outcomes from gateway 1 and gateway 2 are used to check progress of the apprentice against the work based learning guide for the apprenticeship standard and to ensure that they have demonstrated to the employer they are fully competent at the end of their training. Assessment organisations will need to see evidence that a review of gateway 1 and gateway 2 has taken place and that the employer has confirmed the vocational competence of the apprentice by signing off the completed vocational competence evaluation log before the formal end assessment tests can be conducted.

3.2.3 *Behaviours evaluation log*

During their training the apprentice's behaviours should be evaluated against the apprenticeship standard. It is recommended that this is carried out a minimum of three times. This should be at the end of the foundation phase, at the midpoint of the consolidation phase and at gateway two. The outcome from the last evaluation should be brought as evidence to the vocational competence discussion and will contribute to the grading of the apprenticeship award.

3.3 End Assessment Specification

On completion of Gateway 1 and 2 the employer will sign off the apprentice as ready for the formal end assessment, which must be conducted in the workplace. Formal end assessment which will take place during the last 3 months of the apprenticeship will comprise:

- Review of behaviours evaluation log
- Synoptic assessment test (SAT)
- Vocational competence discussion
- Scenario case study

Synoptic Assessment Test

The employer will be able to select one of these SATs to suit the assessment context:

Science manufacturing technician SAT 1 – start up process

- Demonstrate either independently or within a team start-up of a manufacturing batch or continuous process in line with appropriate Standard Operating Procedures (SOP), ensuring work is carried out safely, and quality procedures are followed whilst complying with appropriate regulations.
- Control and monitor the process or plant and equipment, effectively, efficiently and securely, and resolve any problems or correct abnormal conditions that may arise.
- Demonstrate an understanding of the principles of operation through workplace discussion.

Science manufacturing technician SAT 2 - operate process

- Demonstrate either independently or within a team operation of a manufacturing batch or continuous process in line with appropriate Standard Operating Procedures (SOP), ensuring work is carried out safely, and quality procedures are followed whilst complying with appropriate regulations.
- Control and monitor the process or plant and equipment, effectively, efficiently and securely, and resolve any problems or correct abnormal conditions that may arise.
- Demonstrate an understanding of the principles of operation through workplace discussion.

Science manufacturing technician SAT 3 - shut down process

- Demonstrate either independently or within a team shut down/complete a run of a manufacturing batch or continuous process in line with appropriate Standard Operating Procedures (SOP), ensuring work is carried out safely, and quality procedures are followed whilst complying with appropriate regulations.
- Control and monitor the process or plant and equipment, effectively, efficiently and securely, and resolve any problems or correct abnormal conditions that may arise.
- Demonstrate an understanding of the principles of operation through workplace discussion.

For example, an apprentice working on a continuous process, where the opportunity for start-up and shut down occurs infrequently, would be tested using SAT 2 that covers operating the process.

Vocational Competence Discussion

The vocational competence discussion will cover the whole apprenticeship standard. It also provides the opportunity for presentation of evidence to support specific elements from the standard that it has not been possible to demonstrate during the SAT. As the discussion will be graded, Trailblazer employers have specified the following as areas where the apprentice may wish to provide evidence to contribute to grading:

- Control and monitor a process or plant and equipment, effectively, efficiently and securely, and resolve problems or correct abnormal conditions.
- Complete documentation relevant to the manufacturing process including relevant calculations.
- Participate in continuous performance improvement.

Scenario Case Study

The case study will describe a scenario where the apprentice has to adapt quickly and function effectively after minimal instruction on new equipment or in a new environment or under revised working practices. Whilst they will not be expected to know how to operate the particular equipment they will be expected to demonstrate the correct procedures to ensure they work safely, such as following safe systems of work, using appropriate personal protective equipment, finding and following standard operating procedures. The apprentice will be provided with a description of the scenario, which may be a narrative or a video and they will have to respond to situational analysis questions.

Behaviours Evaluation Log

During their training an apprentice's behaviours will be evaluated on at least 3 occasions. The evaluation will be across seven categories:

- Personal Responsibility
- Communication
- Team Work
- Independence and Responsibility
- Impact of work
- Time management
- Change Management

There will be 3 possible outcomes:

Does not meet Expectation:

Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required.

Meets Expectation:

Apprentice demonstrated acceptable level of behaviour and meets the minimum level of behaviour expected.

Exceeds Expectation:

Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices.

The behaviours evaluation matrix in the work based learning guide specifies the assessment criteria that should be used when completing the behaviours evaluation log. The outcome from the final evaluation at gateway 2 will be reviewed during the vocational competence discussion and will contribute to grading of the apprenticeship award.

3.4 The End Assessment Process

The employer will select an assessment organisation from the register of apprentice assessment organisations (ROAAO). The assessment organisation must use assessors/assurers that meet the required standards set by the LS&IS Trailblazer employers (section 4). The assessment organisation will nominate an external assurer and the employer will nominate an assessor; both must meet the required assessor standards set by the LS&IS Trailblazer employers.

Before commencement of the formal end assessment, the employer will draw up an end assessment schedule for the SAT and the other two assessment instruments. The schedule will indicate the period over which the SAT will take place, which will reflect the complexity of the tasks and operational needs of the business, and who will conduct the assessment. The end assessment schedule will also show when the external assurer will observe part of the SAT to verify that the assessor is conducting it in accordance with the SAT specification and the assessment organisation's protocols.

The external assurer will check that the end assessment schedule meets the specification for the SAT and will confirm to the employer that they have accepted the end assessment schedule. In this way the employer with the support of the assessment organisation can plan for the formal end assessment so it is conducted with minimum disruption to the business.

3.4.1 *Synoptic Assessment Test (SAT)*

The end point assessment will include a synoptic assessment test (SAT) through workplace observation and discussion with the registered assessor. Part of the SAT must be observed by an external assurer from the assessment organisation. The SAT must be conducted before the vocational competence discussion and preferably on the same day where business operations permit. The assessment organisation must provide guidance to the registered assessor on how the test must be run with details of performance standards and assessment criteria.

Purpose

The purpose of the synoptic assessment test is to validate the apprentice's competence by observing him/her carrying out his/her job role in a normal working environment under normal conditions. The following aspects should be displayed:

- Working safely
- Following procedures/work instructions
- Complying with regulations
- Following quality systems
- Using appropriate vocational skills

Test methodology (conditions)

The test will be in the form of an observation in the workplace under the following conditions:

- a. observation carried out by a registered assessor
- b. a timescale of between two and four hours on a single occasion
- c. with no coaching or mentoring from colleagues
- d. in the normal working environment

- e. under observation by the external assurer
- f. where the situation demands it simulation will be allowed
- g. walk through/talk through of the simulation should be conducted by the assessor and noted on the documentation
- h. previously planned to ensure that the proposed activity/activities meet the SAT specification
- i. the outcomes are documented using the assessment organisation’s standard documentation.

Test rules

- a. The registered assessor and external assurer must agree the dates of the SAT and vocational competence discussion.
- b. Any special needs of the apprentice must be taken into consideration.
- c. The signed independent assessor declaration must be made available to the external assurer before the SAT commences (see section 3.6).
- d. The registered assessor may notify the apprentice of the date of the SAT and vocational competence discussion.
- e. Test details must not be shared with the apprentice before the test.
- f. The registered assessor must make the SAT process clear to the apprentice.
- g. The apprentice must confirm in writing that he/she understands the SAT process.
- h. The apprentice must be given the criteria against which his/her competence will be assessed during the SAT.
- i. The apprentice must be given the opportunity to ensure that any relevant documentation is available and have materials and equipment prepared for the SAT.
- j. The registered assessor must be objective and therefore must not coach or mentor the apprentice prior to the SAT.
- k. Colleagues should not bias the validity of the assessment process by advising the apprentice about how to conduct activities.
- l. The planned activity must be completed except where safety is compromised by its continuance.
- m. The registered assessor must use the following assessment criteria :

Fail	For one or more elements of the specification the apprentice has an incomplete understanding, approaches tasks mechanistically and needs supervision to complete them.
Pass	For all elements of the specification, the apprentice has a good working and background understanding, sees actions in context, able to complete work independently to a standard that is acceptable.

- n. The registered assessor must not inform the apprentice of the outcome of the assessment.
- o. The registered assessor and external assurer must both complete observation forms for the SAT.
- p. Immediately following completion of the SAT, the registered assessor and external assurer must meet to review the completed observation documentation and discuss the observations of the registered assessor.
- q. The registered assessor and external assurer must agree that the SAT specification has been fully covered and the test rules have been followed.

- r. The registered assessor and external assurer must discuss whether the apprentice has met the assessment criteria required for a pass.
- s. Both the registered assessor and external assurer must agree whether the apprentice has achieved a pass.
- t. The registered assessor and the external assurer must both approve the outcome of the SAT by signing and dating the documentation.
- u. Ensure that the outcome of the SAT is notified to the assessment organisation within the agreed timescale.

The SAT allows the apprentice to demonstrate to the assessor that they are able to holistically use their skills, knowledge and understanding to be able to work safely, effectively and independently with minimum supervision whilst following quality systems within a regulated environment. Performance in the SAT will be verified by the external assurer, who will refer any disagreements about the outcome to the assessment organisation to make the final decision.

The synoptic assessment test will form the basis for the subsequent vocational competence discussion with the external assurer.

3.4.2 Vocational competence discussion

Following the SAT the apprentice will take part in a vocational competence discussion led by the external assurer. This will cover the whole apprenticeship standard including behaviours and the apprentice may draw on evidence from the SAT and evidence generated during the vocational competence evaluation process. The assessment specification, (see section 3.3), makes clear which elements of the standard must be covered. The assessment organisation must ensure the apprentice and their employer are notified of the assessment specification at the start of their apprenticeship so that they can gather appropriate evidence during their training.

Purpose

The purpose is to determine the extent to which the apprentice understands the requirements of his/her role as defined by the work-based learning guide and to explore understanding of areas not observed or explained during the SAT

Test methodology (conditions)

The VCD

- a. will be in the format of a 1:1 discussion with the external assurer.
- b. will last between 1 and 1.5 hours.
- c. will take place in a room, free from distractions with no other people present.
- d. may be recorded with the agreement of the employer and the apprentice.

Eligible evidence

The apprentice may bring along any of the following to refer to during the VCD:

- Vocational competence evaluation log
- Training records
- NVQ Portfolio

- Qualification assessments
- Company specific documents (e.g. risk assessments, SOPs).
- E-portfolios
- Reflective learning logs
- Behaviours evaluation log

Test rules

The external assurer should

- Plan the VCD prior to it taking place and ensure that it is relevant to the standard and its work based learning guide.
- Ensure that the location for the VCD is appropriate.
- Ensure any special needs of the apprentice are taken into consideration.
- Ensure that the learner understands the VCD process, the possible outcomes and how it is graded.
- Ensure that the learner is at ease.
- Ensure that he/she has the grading matrix and relevant documentation to hand before commencing the VCD.
- Complete the relevant documentation, taking notes of what is said, as appropriate and send it to the assessment organisation within the agreed timescale.
- Ensure that the outcome of the VCD is notified to the assessment organisation within the agreed timescale.

The apprentice will achieve a mark for this element of the end assessment that will contribute to the final grade of the apprenticeship award.

3.4.3 Scenario Case Study

The case study will describe a scenario and the apprentice will be presented with a standardised set of questions.

The apprentice will complete a written situational analysis exercise that presents a scenario that requires them to adapt quickly and function effectively after minimal instruction on new equipment or in a new environment or under revised working practices. The exercise will test the apprentice's knowledge and understanding of core elements in the work based learning guide. The assessment organisation will develop a bank of case studies that describe a range of contexts and settings. The emphasis of the exercise will be on the apprentice demonstrating how to transfer and apply their understanding of the principles of working safely, following quality procedures and complying with regulations to a new setting.

The assessment organisation will develop the simulated scenario and question set, define the assessment criteria and the marking scheme.

Purpose

To ensure that the apprentice is able to transfer the knowledge and skills learnt during the apprenticeship to a prescribed situation. This assessment will take the form of a situational analysis of a given case study.

Test methodology (conditions)

- The case study will be invigilated by the external assurer.
- The case study will last for 2.5 hours.
- The case study will take place in a room, free from distractions.
- The apprentice will record his/her analysis on the documentation prescribed for the case study.
- The case study will be marked by the external assurer and moderation of the marked/graded paper will be conducted by the assessment organisation.
- The case study will be given to the apprentice at the beginning of the assessment and not before.
- At the end of the assessment, the case study will be collected by the external assurer.

Test rules

The external assurer should:

- Agree a date with the employer for the case study at least 4 weeks prior to it taking place.
- Ensure that the case study chosen is representative of the occupation that the apprentice is undertaking and the context in which they are working.
- Ensure that the venue for the case study is appropriate.
- Ensure any special needs of the apprentice are taken into consideration
- Ensure that the apprentice understands the case study process, the possible outcomes, how it is graded.
- Ensure that the apprentice is at ease.
- Ensure that the case study is completed within the allocated time.
- Submit the completed case study in accordance with the assessment organisation procedures and within the agreed time scales.

An assessment organisation moderator will:

- Ensure the assessment is fair and consistent
- Review the marks/grade allocated by the external assurer and indicate if modification is required to the case study grade. The moderated grade will be the one accepted.

3.5 Grading

This formal end assessment for the apprenticeship award is graded and an apprentice must achieve a pass to gain a certificate of completion. The grading metrics are:

Apprenticeship Award Grading Metrics	Pass¹	Distinction²
Synoptic Assessment Test	pass	pass
behaviours evaluation log gateway 2 score	Meets expectations	Exceeds expectations
Vocational competence discussion up to 80 marks	Minimum 40	60 or above
Case study Up to 20 marks	Minimum 10	15 or above

¹ A pass will be awarded to individuals that achieve the specified level in all four elements.

² A distinction will be awarded to individuals that achieve the specified level in all four elements.

The assessment organisation will provide the marking scheme that is consistent with these grading metrics. Apprentices will not be able to gain a certificate of completion without completing the formal end assessment test.

3.6 The roles of the assessor and external assurer

Assessment organisations (AO) will train assessors and external assurers in the apprenticeship assessment methodology and quality assurance processes. Their details will be held on a register (see section 4.3.3).

The end assessments must be delivered in such a way that no party who has been involved in delivery can make the sole decision on competence. The approach must clearly deliver an impartial result. For this reason the external assurer must not be linked to the training provider or the employer.

A registered assessor will generally be employed by the apprentice's workplace. They will be responsible for reviewing and signing off the competence evaluation log and the behaviours evaluation log to confirm they are an accurate and valid record of the evaluation of an apprentice's competence and behaviours. The registered assessor will also be responsible for supporting the delivery of the SAT, where the apprentice will demonstrate through performing their job role that they have met the assessment specification. In some instances the employer, for example an SME, may wish to contract a registered assessor from outside their company if they do not have the capacity or capability to provide an internal registered assessor. This external registered assessor will perform exactly the same role as an internal registered assessor.

An external assurer will be provided by the assessment organisation. They will be responsible for managing the end point assessment process. They will observe the SAT and agree the outcome with the registered assessor, conduct the vocational competence discussion and invigilate the scenario case study.

The external assurer must be independent. Any individual involved in training, formative assessment or competence evaluation of the apprentice would not be permitted to do this.

Gateway 1

Evidence of completion of gateway 1, through sign-off in the competence evaluation log, will be a pre-requisite for participation in the formal end assessment. This may be signed off by an assessor/workplace manager who does not need to be registered with the assessment organisation.

Gateway 2

Elements of the vocational competence evaluation Log (CEL) may be signed off during the course of the training by one or a number of assessors/workplace managers who need not be registered assessors. The vocational competence evaluation log must demonstrate that the judgements made by individual employers have been arrived at following industry good practice. Assessment organisations should provide guidance on the criteria the log needs to meet. The assessment organisation does not quality assure the processes an employer uses for competency evaluation, however sign off of the vocational competence evaluation log for gateway two will have to be done by a registered assessor to verify that the apprentice is ready for end assessment.

In every instance the CEL must be countersigned by the employer to confirm that they agree the apprentice is competent.

Review of vocational competence evaluation log

The external assurer will review the vocational competence evaluation log to ensure it has been completed and signed off by a registered assessor and the employer.

Formal End Assessment

Once the apprentice goes through Gateways 1 and 2 they will undertake formal end assessment.

Synoptic Assessment Test

The SAT will take place in the workplace where the registered assessor will observe the apprentice’s performance on the job to ensure that the apprentice fulfils the SAT specification. This process will be observed by a registered external assurer to ensure the registered assessor is complying with the assessment test protocols that the assessment organisation will provide in their guidance.

Vocational Competence Discussion

A registered external assurer will lead a vocational competence discussion that may cover the whole of the apprenticeship standard including behaviours.

Scenario Case Study

A registered external assurer will invigilate the apprentice as they complete the scenario case study.

	Gateway 1	Gateway 2	Behaviours Evaluation Log	SAT	VCD	SCS
Assess	Employer specified Assessor	Employer specified Assessor	Employer specified Assessor	Registered Assessor	Registered External Assurer	Invigilated by Registered External Assurer
Verify	AO	Registered Assessor	Registered Assessor	Registered External Assurer	AO	Marked by AO
Assure	-	AO	Registered External Assurer	AO	AO	AO

Independent Assessor Declaration

As confirmation of independence the employer must sign a declaration that the nominated registered assessor has agreed to support the SAT in accordance with the assessment organisation’s protocols to ensure an impartial judgement is achieved. This signed declaration must be made available to the external assurer before the SAT commences.

Moderation and verification

Verification and standardisation of the assessment judgments is part of the assessment organisation’s quality assurance system. The judgement of the registered assessor and the external assurer must be subject to external moderation by the assessment organisation’s quality assurance team. The assessment organisation will monitor the assessment process and verify the assessment judgements to ensure

consistency across assessors and assurers and across employers. The assessment organisation will run standardisation events for external assurers to ensure consistency in the practice of SAT observations and marking vocational competence discussions.

The assessment organisation will issue an assessor pack to the named registered assessor and external assurer. The assessor pack will contain test guides and test documentation. An assessor pack must be treated as a controlled document subject to restricted circulation and secure storage. The assessment organisation will provide protocols for the control of assessment documents and the confidentiality of assessment information.

4 Registered Assessment Organisations

Organisations delivering an independent assessment service must be on the Skills Funding Agency register of apprenticeship assessment organisations. The independent assessment organisation must be able to demonstrate the occupational capacity and capability and the assessment capacity and capability to deliver all four elements of the end point assessment.

The LS&IS Trailblazer employers have specified the quality criteria for assessment organisations, assessors and assessment instrument design. Use of these quality criteria for approving the registration of assessment organisations will ensure that everyone involved in assessment has a consistent approach and operates to the same standards.

4.1 Assessment Organisation Criteria

Assessment organisations must be able to demonstrate understanding and experience of working with science industry employers to improve skills. Specifically they must demonstrate:

- An understanding of the safety critical nature of the science industry demonstrated through evidence of staff or assessor training in process safety or product quality, MHRA or COMAH regulations and/or experience of competency management in science industry.
- Understanding of the skills needs of the science industry demonstrated by a history of working with science industry employers to develop resources to support skills development.
- Sufficient experienced assessors that meet the specified assessor standards able to deliver a national service to large and small employers demonstrated through an assessor register.
- Experience of assessment or qualification design, demonstrated by CV, examples of assessment instruments, references or testimonials.
- Assessment instrument development plan demonstrating timely availability of end tests.
- Internal quality assurance processes of a standard consistent with OfQual general conditions of recognition.
- Willingness to work collaboratively with other assessment organisations to ensure consistency of assessments.

4.2 Assessment Instrument Criteria

The assessment organisations should develop their assessment instruments and supporting materials to reflect the work based learning guide and the assessment specifications. An assessment organisation must produce the full suite of assessment instruments. The assessment instruments must comply with

the assessment plan and the assessment organisation must produce full guidance on the use of each assessment instrument with details of performance standards and assessment criteria.

Assessment organisations must show that they have consulted with employers about their assessment instruments. This should be demonstrated by providing:

- letters of support from at least five employers that are representative of the occupation or occupational group to which the assessment instruments relate. No more than two letters from sole traders and micro-businesses (employing fewer than ten members of staff) will be accepted as evidence of employer support
- a minimum of one letter of support from a recognised and relevant UK professional or trade body representing the industry, occupation(s) or occupational group covered by the content of the assessment instruments.

4.3 Assessor Standards

There are standards for both registered assessors and external assurers. These standards are determined by industry in partnership with Professional Bodies, Science Council and Engineering Council. Life & Industrial Science Apprenticeships have three types of assessor:

i. **Company Competence Assessors**

These assessors measure vocational competence within a company. They continuously evaluate an apprentice's competence to company standards (skills, knowledge and behaviours) to ensure the apprentice can perform the work for which they have been employed. They support and prepare the apprentice for the apprenticeship end test. An employer may nominate an assessor from a training provider to perform this role.

Standard: Defined in house to ensure company standards are met in line with the appropriate regulatory body.

ii. **Apprentice Award End Point Assessment Assessors & External Assurers**

Assessors or external assurers who ensure apprentices have met the apprenticeship standard. They assess an apprentice against the assessment criteria set by industry for the end assessment test.

Standard: registered assessor and registered external assurer.

iii. **Professional Registration Assessors**

Assessors who ensure apprentices meet the registration requirements of EngTech / RSciTech. They assess an apprenticeship against the requirements of UK spec for EngTech or the Science Council criteria for RSciTech.

Standard: If an assessor is performing a professional registration assessment then they only need to meet the Professional Institute's assessor requirements. If a Professional Institute's assessor is also performing an end assessment then they must also be a registered assessor.

4.3.1 **Registered assessor standard criteria**

There are two types of end assessment activity covered by the registered assessor standard:

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- A. Signing off the competence evaluation log.
- B. Assessment of an apprentice's performance in the synoptic assessment test.

Anyone responsible for these end assessment activities must be on a register held by the assessment organisation. The register must confirm the evidence that the assessor meets the registered assessor criteria.

<u>Registered Assessor Standard Criteria</u>	
✓	Vocationally competent with recent continuing professional development and/or Professionally registered
	Plus
✓	experience of current working practices
	Plus
✓	Assessment organisation induction

Registered assessors must be competent in the occupation they are assessing. This is shown through the assessor having achieved a qualification at a level equivalent to or higher than the level of the apprenticeship standard being assessed; or by holding professional recognition at a level equivalent to or higher than the registration level of the apprenticeship standard being assessed.

Registered assessors must be either working in the appropriate sector itself or they must be able to demonstrate they possess practical and up-to-date knowledge and experience of current working practices appropriate to the sector in which they are carrying out assessment practice. There may be a requirement to hold additional specialist training or security clearance as required by the industry sector e.g. nuclear.

The registered assessors must complete an assessment organisation induction to demonstrate working knowledge of the apprenticeship standard and assessment methodology.

4.3.2 Registered external assurer standard criteria

There are five types of end assessment activity covered by the registered external assurer standard:

- C. Review of the behaviours evaluation log
- D. Observation and verification of the assessment of an apprentice's performance in the synoptic assessment test
- E. Assurance of the synoptic assessment test process
- F. Leading the vocational competence discussion
- G. Invigilating the scenario case study.

Anyone responsible for end assessment activities C-G must be on a register held by the assessment organisation. The register must confirm the evidence that the external assurer meets the registered external assurer criteria.

<u>Registered External Assurer Standard Criteria</u>	
✓	Any current UK qualifications for workplace vocational assessors or Cogent Workplace Competence Assessor Award
	plus
✓	Vocationally competent with recent continuing professional development and/or Professionally registered
	plus
✓	Assessment organisation induction

A registered external assurer must hold a current UK qualification for workplace vocational assessors or a Cogent Assessor Gold Standard Award.

Registered external assessurers must be competent in the occupation they are assessing. This is shown through the external assurer having achieved a qualification at a level equivalent to or higher than the level of the apprenticeship standard being assessed; or by holding professional recognition at a level equivalent to or higher than the registration level of the apprenticeship standard being assessed.

Registered external assurer must be able to demonstrate they possess practical and up-to-date knowledge of current working practices appropriate to the sector in which they are carrying out assessment practice. There may be a requirement to hold additional specialist training or security clearance as required by the industry sector e.g. nuclear.

The registered external assurer must complete an assessment organisation induction to demonstrate working knowledge of the apprenticeship standard and assessment methodology.

4.3.3 Assessor and external assurer register

The assessment organisation must hold a register of the assessors and external assessurers that will be used for end assessment. The register should show for each individual that the assessment organisation has looked at a range of evidence that could be a combination of:

- i. personal interview
- ii. qualification certificates
- iii. CPD certificates
- iv. employment history
- v. testimonials

- vi. specialist training or security clearance documents
- vii. assessment organisation induction training certificate
- viii. apprenticeship standard end assessment track record.

An individual's registration status must be revised every 12 months to show that assessor standards are being maintained. The register should also include details of the individual's end assessment experience and identify which assessments they have delivered.

This register and the associated assessment records should be made available for independent audit in line with published quality assurance protocols (See Section 5).

5 Quality Assurance of Science Industry Apprentices Assessment

External quality assurance for the science manufacturing technician apprenticeship will initially be undertaken by the Institute for Apprenticeships, whilst we are in conversation with Ofqual and professional bodies regarding them undertaking the role.

6 Implementation

The assessment plan has been designed to provide a cost effective assessment approach that meets quality objectives. For this standard there are likely to be small cohorts of apprentices spread nationally, so the assessment model needs to be flexible for delivery in a number of varied settings and contexts. Total annual numbers are estimated to be approximately 200 once SASE frameworks are withdrawn. The qualifications that are required to be completed during the consolidation phase are already available.

For the formal end assessment the external assurer will spend 1-2 days at the apprentice's workplace. It is anticipated that the employer will pay between 15% -20% of the total cost of the apprenticeship for the formal end assessment. The current indicative costs are £3000 per apprentice. The cost of ongoing competence evaluation is considered to be a training cost and does not form part of the cost of assessment for the apprenticeship award as described here.

7 Professional Body Recognition

The Trailblazer employers have worked in partnership with professional bodies to define the apprenticeship standard and the assessment plan to ensure that it maps to the requirements for UK Spec set by the Engineering Council and the requirements for RSciTech set by the Science Council. The scope of the standard and the associated assessment plan means that the individual should not require any further training on completion of their apprenticeship to allow them to apply for professional registration as EngTech or RsciTech.