



Life Sciences and Industrial Science Trailblazer Apprentices Assessment Plan

Laboratory Scientist

March 2016

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for science industries



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Foreword

This assessment plan for Life Science and Industrial Science apprenticeship standard *Laboratory Scientist* 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

This March 2016 version should be used for end point assessment of all new learners plus all learners that started using the standard before this date.

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 Apprenticeship standard:

- **Laboratory Scientist**

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.

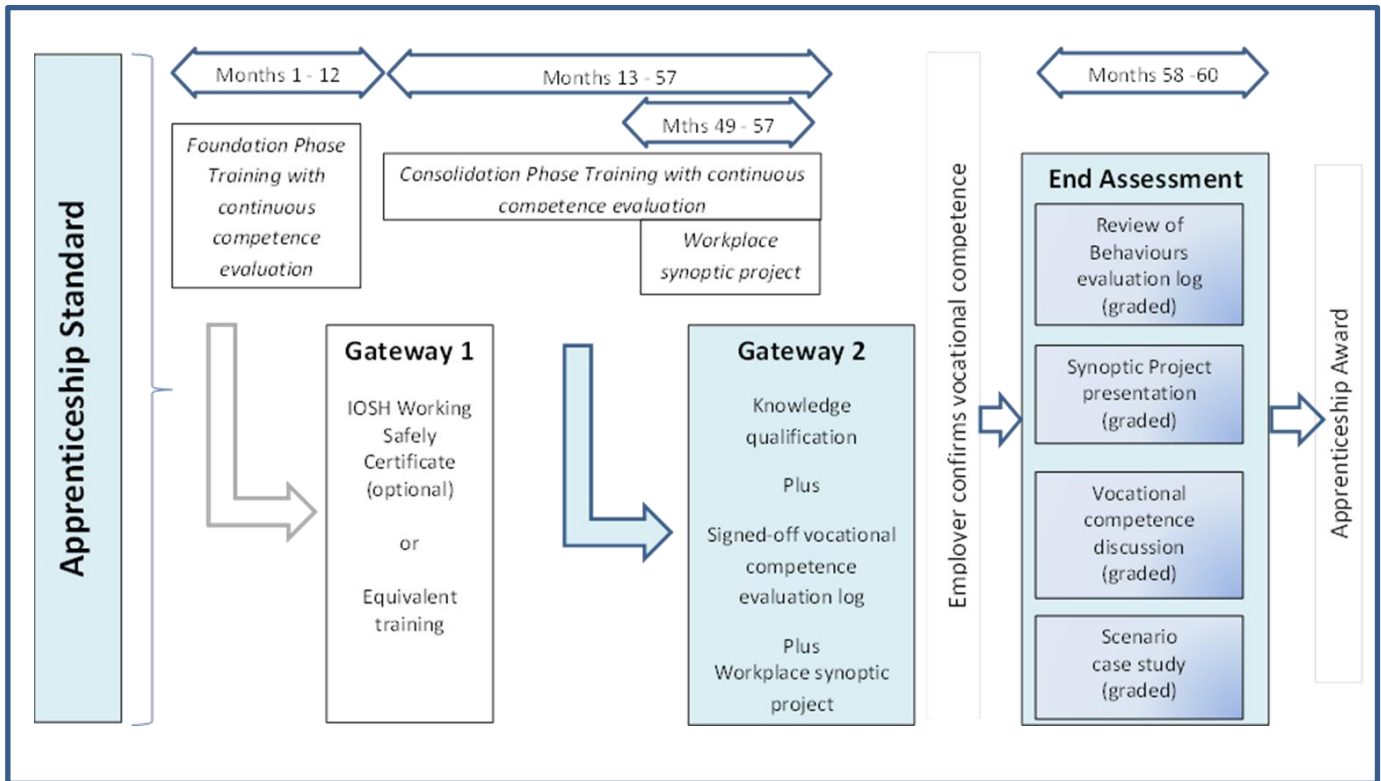
The term employer is used to refer to the host employer, which is the company where the apprentice gains their competency experience. It does not refer to the organisation such as an ATA that has the employment contract with the apprentice.

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

Laboratory Scientist



There are two suggested phases of training. The Foundation Phase, which is typically months 1 -12, 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 from month 13 up to 3 months before the end of the apprenticeship, 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 an HND, Foundation degree or Bachelors degree in an appropriate discipline recognised by a professional institution as suitable for registration for RSci. 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

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meet the apprenticeship standard. A suitably qualified and experienced registered assessor nominated by 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 and registered by the assessment organisation as meeting the required assessor standards.

Formal end assessment completed in the final 3 months will be based on presentation of a workplace synoptic project to a panel that includes an independent external assurer from the assessment organisation.

The external assurer from the assessment organisation will also 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
- Presentation of a workplace synoptic project
- 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 and are exhibiting the appropriate professional behaviours. 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 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 workplace synoptic project, a vocational competence evaluation log and a behaviours evaluation log.

3.2.1 Qualification

The apprentice must complete a qualification that is recognised by the Science Council as leading to Registered Scientist (RSci) status. The qualification must be at level 5 or higher and provide the theoretical knowledge needed for the apprenticeship standard. For example:

- FdSc Chemical Science

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- BSc (Hons) Chemical Science
- BSc (Hons) Applied Bioscience

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 Workplace synoptic project

The workplace synoptic project is a substantial piece of work that will allow the apprentice to plan, develop and implement an individual work-based project. The apprentice will have to show critical analysis of appropriate literature and own data and the development of investigative and work orientated skills. The scope of the project must cover, but need not be limited to:

1: *Planning, Design and Organisation*

Planning and design of project programme of work including recognition of resource implications, ethics, risk assessment, COSHH and other work-based and stakeholder requirements.

2: *Review of Literature*

Use of databases to assess relevant project literature. Critical assessment of original work-based and other literature. Transfer of literature knowledge into experimental plan of work.

3: *Project Implementation*

Competent implementation of project work, including recognition of safe working practices and recording of work and project progress via a reflective record. Feedback of reflection into planning and implementation process.

4: *Results and Conclusions*

Appropriate, timely and concise reporting of project work including data analysis and drawing conclusions via written and oral media.

The project should take place towards the end of the consolidation phase and be of sufficient depth and complexity to require a minimum of 100 hours of work with an additional 50 hours for project reporting. However, the apprentice should not limit the scope of their project to meet this requirement. The project should be conducted as part of an apprentice's normal scientific work; however it may also take additional time outside of working hours.

A summary report in the form of a primary journal article must be prepared for presentation to the end assessment panel. The apprentice may base this report on a workplace project that has been carried out as part of their academic programme. Collaboration between the employer and the Higher Education

Institution (HEI) is encouraged with mentoring support for the apprentice from both the employer and the HEI.

3.2.3 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, a course assessments portfolio, final project workbooks, 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.

3.2.4 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



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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
- Presentation of a workplace synoptic project
- Vocational competence discussion
- Scenario case study

Workplace Synoptic Project Presentation

The workplace synoptic project presentation will be based on a summary report prepared by the apprentice and submitted in advance to the end assessment panel. The summary report and the presentation will be graded. The summary report should be in the form of a primary journal article. This should show the ability to design a work-based independent investigation. The demonstration of innovative/creative-thinking and analytical skills should be showcased.

The scope of the panel discussion will cover:

- Experimental design, methods, results, data analysis, challenging assumptions, drawing conclusions & making recommendations.
- Use of software packages, relevant tools and project management techniques.

The apprentice must demonstrate they have achieved the following learning outcomes:

- Conduct a comprehensive literature review to inform the project scope and definition with identified customers, specific aims & objectives and evidence of stakeholder management.
- Plan and design a programme of work considering safety, sustainability and ethical issues showing working knowledge of scientific project management life cycle approaches.
- Show critical analysis and evaluation of project data/results and drawing appropriate conclusions.
- Use of personal/professional skills such as independence, time management, self-motivation, organisation, critical thinking, teamwork & leadership and good working practices within the context of the work-based project activity.

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 may not have been possible to demonstrate during the workplace synoptic project presentation. 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.

- Lead continuous performance improvement within the scientific and technical environment.
- Use creative thinking and problem solving to challenge assumptions, innovate, make new proposals and build on existing ideas.

Scenario Case Study

The case study will describe a scenario where the apprentice has to carry out an activity in an existing or new setting. Whilst the apprentice will not be expected to know this particular scenario they will be expected to demonstrate the correct approach to ensure they work is conducted safely, using appropriate laboratory techniques, procedures and methods and appropriate personal protective equipment to achieve the specified outcome. 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 & Leadership
- 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.

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Before commencement of the formal end assessment, the employer will draw up an end assessment schedule for the project panel and the other two assessment instruments. The schedule will indicate when the workplace synoptic project presentation will take place and who will attend the panel. The external assurer will attend the panel to verify that it is conducted in accordance with the assessment specification and the assessment organisation's protocols. The external assurer will verify the panel's decision.

The external assurer will check that the end assessment schedule meets the specification for the project panel 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 Workplace Synoptic Project Presentation

The end point assessment will include presentation of a summary report on a workplace synoptic project to a panel, which will include a registered assessor from the employer, a representative from the HEI or a member of an appropriate professional body, an external assurer from the assessment organisation.

Purpose

The purpose of the workplace synoptic project panel is to allow the apprentice to demonstrate working knowledge of project management procedures and the ability to incorporate these into the scientific work environment working with team member. The workplace synoptic project that underpins this assessment will cover the whole of the standard.

Test methodology (conditions)

The panel will be run under the following conditions:

- The panel to comprise 3 members: a registered assessor from the employer, a representative from the HEI or a member of an appropriate professional body and the external assurer.
- The summary paper to be submitted to the assessment organisation 4 weeks before the panel meets.
- The presentation and Q&A to typically last between 45 minutes and 1 hour.
- The panel to take place in a room, free from distractions with no other people present.
- The outcomes to be documented using the assessment organisation's standard documentation.

Panel rules

The external assurer should:

- a. Plan the panel prior to it taking place.
- b. Ensure that the location for the panel is appropriate.
- c. Ensure all panel members have received the summary paper and guide to the panel process 2 weeks before the panel takes place.
- d. Ensure all panel members are fully briefed about the process and the assessment criteria before the panel commences.

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- e. Ensure any special needs of the apprentice are taken into consideration.
- f. Chair the panel.
- g. Ensure that the learner understands the panel process, the possible outcomes and how it is graded.
- h. Ensure that the learner is at ease.
- i. Ensure that the grading matrix and relevant documentation are to hand before commencing.
- j. Ensure the panel use the assessment criteria shown below.
- k. Complete the relevant documentation, taking notes of what is said, as appropriate and send it to assessment organisation within the agreed timescale.
- l. Ensure the apprentice is not informed of the outcome of the assessment.
- m. Facilitate a review of the completed documentation and a discussion of the observations by the panel members.
- n. Agree with the panel members that the workplace synoptic project panel specification has been fully covered and the test rules have been followed.
- o. Ensure the panel members discuss whether the apprentice has met the assessment criteria required for a pass or a distinction.
- p. Ensure all panel members agree the outcome and evidence this by signing and dating the documentation.
- q. Ensure that the outcome of the panel is notified to the assessment organisation within the agreed timescale.

Synoptic Project Presentation assessment criteria

Project Element	Does not meet	Meets expectations	Exceeds expectations
Literature review	Literature review lacks evidence and structure, uses outdated results or inappropriate scientific data	A systematic, critical analysis of relevant scientific literature within a relevant timeframe	
Project scope & definition	Lack of clarity on project scope and boundary definition ill defined	Project scope and boundaries clearly defined. Aims and objectives articulated to customer	
Stakeholder management	Project communication is vague or poor, difficulty conveying meaning to others	Tools used to define project stakeholders internal & external to the project	Demonstrated ability to manage all stakeholders expectations and use scientific judgement to influence project direction
Experimental design	Limited understanding of experimental design	Robust evidence of experimental design to develop hypothesis and design practical work	Advanced statistical techniques used to define design space and project positioning within

Data analysis	Often misinterprets data and uses inappropriate statistical tools to analyse data	Well-structured data analysis using appropriate statistical tools & techniques	Systematic data analysis using advanced statistical tools & techniques
Drawing conclusions & recommendations	Inapposite conclusions based on misinterpretation of literature and data	Reasoned conclusions based on previous literature critiques and appropriate data analysis	Cogent scientific conclusions & logical recommendations for future experimentation
Presentation	Unable to effectively present technical project elements and personal viewpoints	Confident articulate presentation. Deals well with technical questioning with ability to respect opinion of others	Proactively seeks feedback to improve scientific analysis and personal performance

Performance in the presentation will be verified by the external assurer, who will refer any disagreements about the outcome to the assessment organisation to make the final decision.

For the Synoptic Project Presentation to achieve a pass the apprentice must meet expectations for all project elements. A distinction will be awarded where the apprentice exceeds expectations for all of the five elements indicated above. This grade will contribute to the final grade of the apprenticeship award.

3.4.2 Vocational competence discussion

Following the workplace synoptic project presentation 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 workplace synoptic project 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 workplace synoptic project presentation.

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
- Course Assessments Portfolio
- Company specific documents (e.g. risk assessments, SOPs).
- Reflective learning logs
- E-portfolios
- Workplace Project logs
- Behaviours evaluation log

Test rules

The external assurer should

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

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

Test rules

The external assurer should:

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

An assessment organisation moderator will:

- a. Ensure the assessment is fair and consistent
- b. 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.

Apprenticeship Award Grading Metrics	Pass ¹	Distinction ²
Workplace synoptic project panel	Meets	Exceeds

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	expectations	expectations
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

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:

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 4.3.2).

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. A SIAS registered assessor will be a key member of the Workplace Synoptic Project panel. In some instances the employer, for example an SME, may wish to contract a SIAS 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 chair the Workplace Synoptic Project panel, 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 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.

Formal End Assessment

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

Review of behaviours evaluation log

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

Workplace Synoptic Project Presentation (WSP)

The workplace synoptic project presentation will be to a panel where the registered assessor will be a member. This panel will be attended by a registered external assurer to ensure the assessment test protocols are followed. These will be provided by the assessment organisation 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	WSP	VCD	SCS
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Assess	Employer specified Assessor	Employer specified Assessor	Employer specified Assessor	Registered Assessor plus panel members	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 SIAS registered assessor has agreed to support the WSP 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 end assessment 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 judgments 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 moderating panels and marking vocational competence discussions and scenario case studies.

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 on 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

Life Sciences & Industrial Science Apprentices Assessment Plan – Laboratory Scientist

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 RSci. They assess an apprenticeship against the Science Council criteria for Registered Scientist.

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:

- A. Signing off the competence evaluation log.
- B. Assessment of an apprentice's performance in the workplace synoptic project presentation.

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.

Registered Assessor Standard Criteria

- ✓ 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. Assessment of an apprentice's performance in the workplace synoptic project presentation.
- E. Assurance of workplace synoptic project presentation.
- 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.

Registered External Assurer Standard Criteria

- ✓ Any current UK qualifications for workplace vocational assessors
or
Cogent Assessor Gold Standard 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 assessurers 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.

4.3.2 Assessor register

The assessment organisation must hold a register of the assessurers 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

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- 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

The assessor registration status must be reviewed every 12 months to show that assessor standards are being maintained. The register should also include the assessors end assessment experience and identify which assessments they 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

LS&IS Trailblazer employers are in discussion with BIS regarding quality assurance and governance arrangements; assessment organisations will need to comply with any arrangements that are approved and subsequently published.

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 100 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 Registered Scientist 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 RSci.