SIAS

Laboratory Scientist (ST0247)

Level 5 Apprenticeship Standard

End-Point Assessment Specification

SIAS

Contents

This specification describes the end-point assessment tests, the test rules and who should be involved. Preparing for end-point assessment including gateway requirements are also covered.

SIAS is the Science Industry Assessment Service. It is part of the Cogent Skills Group. For further information about apprenticeship standards and Trailblazers please contact info@siasuk.com.

In this guide, 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 an organisation such as an Apprenticeship Training Agency (ATA) that has the employment contract with the apprentice.

SIAS

Qualification Objective

The aim of this qualification is to ensure that the apprentice is occupationally competent against the knowledge, skills and behaviours outlined in the assessment plan for this standard.

A fully competent Laboratory Scientist will be able to work in a wide range of organisations, including but not exclusively, chemical, pharmaceutical, biotechnology, formulated products, nuclear and analytical services. A scientist can carry out a range of technical and scientific activities which may include laboratory-based investigations and scientific experimentation in their specialist field. They will analyse, interpret, and evaluate relevant scientific information, concepts and ideas and use these to develop subsequent experiments or investigations and to propose solutions to problems. They will be able to apply knowledge of underlying scientific principles to implement new processes according to the literature or input from senior team members. They will be able to work autonomously and part of a wider scientific team, taking responsibility for the quality of the work that is undertaken, to deliver scientific value to their organisation. They will be proactive in finding solutions to problems, be able to identify areas of business improvement and propose innovative scientific ideas. In all contexts working safely and ethically is paramount and many companies operate under highly regulated conditions because of the need to control the quality and safety, for example medicines.

Prior Learning and Qualifications

Individual employers will set the selection criteria for their apprentices. Most candidates will have achieved grade C or above in English and mathematics at GCSE level prior to commencement of apprenticeship. Most candidates will also hold A-levels or existing relevant Level 3 qualifications or equivalent. Other relevant or prior experience may also be considered as an alternative.

A Summary of Laboratory Scientist End-Point Assessment
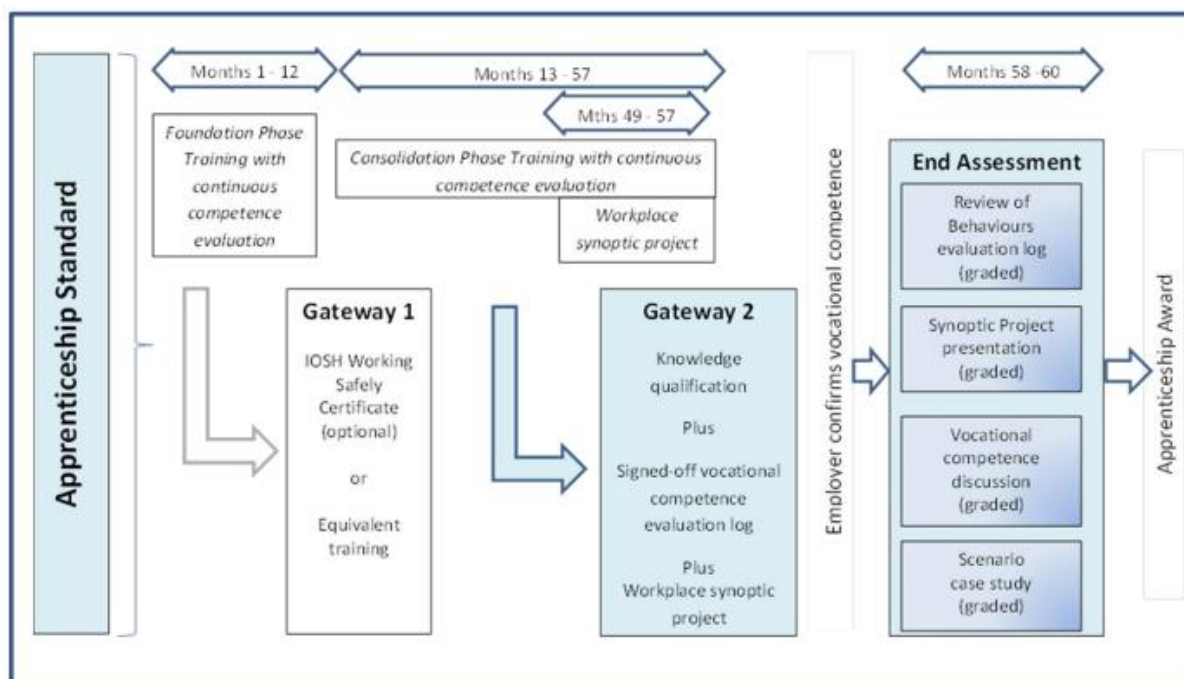
There are two suggested phases of training. The Foundation Phase, which is typically months 1 -12, will focus on developing the apprentice's core skills, knowledge, and

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 bachelor's 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 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.

About Competence Evaluation

During the apprenticeship, regular evaluation of the competence of the apprentice against the apprenticeship standard will help to ensure that they achieve full occupational competence by the end of their training, and they are ready for end-point assessment. Confirmation from the employer that the apprentice is fully competent is needed before end-point assessment can take place.

As competence evaluation is an in-programme activity, the process that is used for this has not been mandated. It is for the employer supported by their training provider to decide how they wish to do this. To help with this SIAS has produced the SIAS Competence Tracker.

Competence Evaluation Log (CEL)

The evidence that the apprentice is ready for end-point assessment is the signed SIAS Competence Evaluation Log (CEL). The CEL covers the knowledge, skills and behaviours specified in the apprenticeship standard. The signed log shows that the apprentice has demonstrated to the employer they are fully competent at the end of their training. It has the same status as a qualification certificate. Along with the qualification certificates, a signed completed CEL is one of the requirements for the Gateway.

Readiness for End-Point Assessment (EPA) – Gateway

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.

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.

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.

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

- 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.

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.

Vocational Competence Evaluation Log (CEL)

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. This is all covered in the SIAS CEL document.

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.

Stages of End-Point Assessment

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

Review of Behaviour 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
- Teamwork
- Independence and Responsibility
- Impact of work
- Time management
- Change Management

Outcome	Description
Does not meet Expectations	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 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.

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 SIAS.

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.

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

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.

A full list of the assessment rules can be found in the assessment plan.

The Synoptic Project Presentation will be assessed using the following 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	Confident articulate presentation. Deals well with technical	Proactively seeks feedback to improve scientific analysis

	and personal viewpoints	questioning with ability to respect opinion of others	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.

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 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

A full list of the assessment rules can be found in the assessment plan.

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

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.

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 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

A full list of the assessment rules can be found in the assessment plan.

Moderation

Assessment organisations will undertake moderation of independent examiner and technical experts' decisions through observations and examination of documentation on a risk sampling basis, i.e., a minimum of 20% for experienced examiners / technical experts and 100% for new examiners / experts or where inconsistencies have been identified or where the technical expert has been recruited from the employer due to site requirements. Results cannot be confirmed until moderation has been completed.

Re-takes / re-sits

Re-takes / re-sits will only be available to apprentices who fail an end-point assessment element(s) i.e., they are not offered to apprentices wishing to move from Pass to Distinction. Apprentices may re-take / re-sit one or more elements within the six-month end-point assessment period. Re-take / re-sits outside of the six-month end-point assessment period would require all elements to be re-assessed. Re-sits / re-takes will not be awarded a grade higher than Pass. Apprentices must have a supportive action plan to prepare for the re-take / re-sit. Further re-takes / re-sits would be at the discretion of the employer following a 1:1 review with the apprentice to determine the suitability of the apprentice for further testing.

Final Grade

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 Awarding Grading Matrix	Pass A pass will be awarded to individuals that achieve the specified level in all four elements.	Distinction A distinction will be awarded to individuals that achieve the specified level in all four elements
Workplace Synoptic Project Panel	Meets	Exceeds
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 60 marks	Minimum 30	45 or above

Certification

The outcomes from the end-point assessment will be reviewed and a grade conferred by SIAS in accordance with SIAS QA procedures, which are available from SIAS. SIAS will notify the employer of the outcome of each of the assessments.

SIAS will apply for the apprentice's certificate, which will be sent to the employer. The certificate confirms that the apprentice has passed the end-point assessment, has demonstrated full competency across the standard and is job-ready.

Assessment Specification

The assessment specification can be found in the published assessment plan for the standard. Details of which elements of the apprenticeship standard will be tested by each test are given in the Core Competencies section of this document.

SIAS

Core Competencies

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
CORE REQUIREMENTS: KNOWLEDGE	
S1	**Apply knowledge of underlying scientific principles in laboratory-based experimentation and implement new processes according to the literature or input from colleagues**
S2	**Demonstrate and explain the principles of laboratory techniques and scientific experimentation to contribute to the development of scientific technical projects**
S3	**Develop and apply a theoretical knowledge of the advanced science and technology required to progress in the job role and relevant area of specialism**
1	On completion, apprentices will hold a Higher National Diploma or Foundation Degree qualification recognised by the Science Council at minimum Level 5, or where appropriate an honours degree at Level 6, in a discipline relevant to their job role. Details of suitable qualifications can be obtained from the Science Council (http: / / www.sciencecouncil.org / Rsci)
S4	**Demonstrate working knowledge of project management procedures and the ability to incorporate these into the scientific work environment working with team members**
2	Competent in project management tools and techniques, including software packages pertinent to the role and techniques used within the industry
3	Demonstrate practical application of project management life cycle approaches including, but not limited to, project identification, conducting scientific research to analyse options, experimental design, interpretation of results, drawing conclusion and recommendations that achieve the project aim
4	Manage the communication requirements of project management including the tools for stakeholder management
S5	**Understand the internal and external regulatory environment pertinent to the sector and the sponsoring organisation and comply with regulations including compliance with business rules pertaining to record keeping, traceability & confidentiality.**
6	Demonstrate and adhere to the internal regulations pertinent to the sponsoring company & relative specialism in which they operate (e.g., Good Laboratory Practice, Good Manufacturing Practice, Good Documentation Practice, Good Clinical Practice, ISO17025)
7	Understand and adhere to the external regulatory requirements pertinent to the sponsoring company, relative specialism, and region in which they operate (e.g., COMAH, MHRA, FDA, ONR, Animal Scientific Procedures Act 1986 and Directive 2010 / 63 / EU (ETS123 Guidelines))
S6	**Understand the business environment in which the company operates including personal role within the organisation, ethical practice, and codes of conduct**
8	Understand the wider business environment (customers, competitors etc.) in which the organisation operates and how the roles of different departments or functions interact to deliver overall business objectives

SIAS

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
9	Understand own role within the organisation and how it impacts / influences the business; demonstrate understanding and compliance with relevant codes of conduct and ethical practice (e.g., GLP, environmental considerations, professional body code of conduct, company code of conduct)
S7	**Identify and understand the requirements of internal or external customers and recommend the appropriate workflows, improvements, or scientific solutions**
10	Identify customer's underlying needs (internal / external) and determine whether these needs can be addressed by a scientific approach
11	Identify operational constraints which could affect the scientific approach to meeting a customer's requirements
12	Identify and develop hypothesis from relevant scientific information to address customer needs and agree appropriate performance criteria with the customer
13	Demonstrate professional interaction with customers, using solicited feedback for self-directed learning and personal improvement
CORE REQUIREMENTS: SKILLS	
S8	Prepare for and perform laboratory tasks using the appropriate scientific techniques, procedures, and methods of relevance to the activities of the laboratory
14	Understand and apply a variety of documents such as Standard Operating Procedures and Test Methods in line with company policy
15	Prepare for, and perform, laboratory experiments, tests or tasks following specified methodologies to provide reliable, accurate data for example • Spectroscopic / optical techniques • Cell-based immunoassays • Solution chemistry • Electrochemical / thermal / separation techniques • Analytical methods / Chromatography • Biochemical techniques • Computer modelling / digital design technologies • Radiochemical & Radiometric Techniques
16	Using advanced laboratory techniques relevant to job role be able to describe the theory, application, and challenge assumptions
17	Demonstrate technical competence in the use of specified instruments and equipment, where appropriate developing subject matter expertise with a suitable technology
18	Understand and demonstrate appropriate sampling procedures and relevant sampling techniques
19	Demonstrate theoretical and practical understanding of maintenance procedures, report faults and seek diagnostic advice to maintain equipment and facilities in good working order, including calibration where required

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
20	Demonstrate an understanding of the relevant good laboratory documentation practices keeping accurate records of laboratory work undertaken, analysis of results and conclusions drawn
21	Contribute to the preparation of scientific and technical reports to a level commensurate with the expectations of the job role
22	Understand the principles behind valid analytical measurements, method performance characteristics, uncertainties in analytical results and method verification / validation
S9	**Work safely within a laboratory environment, maintaining excellent housekeeping whilst following appropriate safety, environment, and risk management systems**
9a	**General workplace Health and Safety**
23	Demonstrate and comply with foundations of health and safety including responsibility for workplace safety under 'Health & Safety at Work Act'
24	Understand the procedures for first aid relevant to your workplace
25	Demonstrate and comply with risk assessment & control measures including 'Control of Substances Hazardous to Health' risk assessments, Material Hazards and Safety Data Sheets including potent materials and controlled substances, where appropriate
26	Demonstrate appropriate use of personal protective equipment i.e., face mask, fume hoods
27	Understand and practice fire and electrical safety procedures in the workplace
28	Understand and practice safe manual handling and repetitive activities, including correct use of Display Screen Equipment
29	Demonstrate and comply with site and local emergency procedures, relevant organisation safety policies and procedures
9b	**Laboratory Safety & Housekeeping**
30	Work safely in a laboratory and maintain excellent housekeeping, in accordance with organisation operating procedures
31	Identify potential safety hazards and recommend solutions to improve safety standards, report incidents and near misses
32	Order and control stocks of laboratory materials and equipment where required
33	Perform internal auditing in support of local health and safety policies, raise and allocate corrective actions and close designated tasks to time
34	Understand, follow, and write local risk assessments for work carried out within own laboratory space
35	Demonstrate and comply with laboratory health and safety and compliance with legal, regulatory, ethical requirements
9c	**Environmental Management**
36	Understand and apply procedures for the management and control of laboratory waste, handling, and disposal of chemical and biological substances
37	Understand environmental risk assessments (impact assessment)
38	Understand and apply the concepts of resource efficiency to energy, water, and waste

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
S10	**Promote and ensure the application of quality standards relevant to the workplace**
39	Understand, follow, and promote company quality procedures to meet the requirements of quality standards relevant to the workplace
40	Recognise when something has not been carried out correctly within the laboratory environment, promote behaviour amongst colleagues and explain the impact this could have
41	Perform internal auditing in support of local quality policies, raise and allocate corrective actions and close designated tasks to time
42	Complete documentation proficiently including relevant calculations including understanding error reporting and correction techniques
43	Competent in laboratory investigations, including reporting out of specification results, and be able to recommend applicable corrective and preventative actions to address the investigation
44	Understand the benefits and requirements of accreditation of an analytical service provision e.g., ISO 17025, both for routine (proven and accredited) methods and for methods under development, where applicable.
S11	**Work autonomously to analyse, interpret, and evaluate scientific data and present the results of laboratory work and problem solving clearly and concisely in written and oral form**
45	Use statistics in experimental designs to enable the effective measurement of the experimental variables and their interaction
46	Practical demonstration of one or more problem solving techniques
47	Demonstrate the use of advanced statistical analysis techniques for evaluation of results and data presentation to a technical audience
48	Demonstrate identification of sources of error and how they can be reduced e.g., human error
49	Demonstrate the use of standard and non-standard software packages and applications
50	Understand and demonstrate the application of the principles of Laboratory Information Management systems digital or paper based
51	Understand and apply basic root cause analysis
52	Challenge routine practices and address non-routine problems with appropriate sampling and instrumentation, within defined areas
53	Identify and critically evaluate relevant scientific information from appropriate technical resources e.g., databases, scientific literature, and challenge assumptions in order to contribute to novel solutions
S12	**Lead continuous performance improvement within the scientific and technical environment**
54	Participate in improving systems and processes within your work environment or demonstrate where you have personally improved and become more efficient
55	Active member and / or project lead of a continuous improvement project that delivers recognised efficiencies within own workspace
56	Understand how workplace organisation techniques can be applied to improve workflow of the laboratory
57	Demonstrate one or more continuous improvement techniques e.g.

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
	• Workplace organisation techniques • Management strategies such as 'Lean' or 'Six Sigma' • Accreditation (e.g., ISO, UKAS), external audits • Reduction of 'waste' • Internal auditing process
S13	**Use creative thinking and problem solving to challenge assumptions, innovate, make new proposals, and build on existing ideas**
58	Propose new or unusual approaches to existing problems, testing the hypothesis with critical evaluation of the results
59	From research apply learned models and concepts to analyse situations, contribute to ideation
60	Challenge underlying assumptions and established ways of working
S14	**Plan and prioritise tasks, review and evaluate progress against objectives and investigate alternative scenarios**
61	Break down departmental goals or organisational objectives into a manageable personal action plan aligned with the business vision
62	Identify important personal and workgroup results that need to be achieved on a week-by-week basis
63	Continuously monitor personal progress against objectives, revisit plans and suggest alternative tasks to achieve objectives
64	Drive project contingency planning
CORE REQUIREMENTS: BEHAVIOURS	
S15	**Communicate effectively using a full range of skills: speaking to a scientific and non-scientific audience, active listening, professional writing, professional body language, scientific presentation**
65	Readily comprehends oral and / or written instructions when first presented and able to present scientific / technical information to a range of audiences
66	Passes on information both verbal and written, in a way that is easily understood to a wider technical team
67	Listens and will question and challenge appropriately to enhance own understanding
68	Able to effectively present personal viewpoint and influence others within the team
69	Receptive to other people's point of view
70	Take part in technical presentations to a scientific audience both within the workplace and external to the area of expertise
71	Participate in community or academic projects to promote science to a non-technical audience (internal / external)
72	Present technical poster, abstract and formal written scientific poster to an appropriate audience (internal / external)
S16	**Demonstrate reliability, integrity, and respect for confidentiality on work related and personal matters, including appropriate use of social media and information systems**
73	Understand confidentiality policies within the workplace and know how to apply them

Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements within the core competencies are mandatory
74	Appropriate use of social and business media within the workplace and understand application of company policies
75	Adhere to company Information Technology policies including appropriate use of e-mail and professional electronic communication
76	Adhere to document security classification and understand the control requirements for technical / scientific publications, e.g., internal and external reports and presentations
S17	**Work autonomously and interact effectively within a wide, multi-disciplinary project team.**
77	Make useful contribution during wider team discussions and initiates problem solving
78	Demonstrates knowledge and understanding of team organisation / mission and how this fits into the sector
79	Works cooperatively with others to achieve overall team goals and understands how these influence the wider organisation
80	Works autonomously, can be trusted to complete tasks and Identifies obstacles to achieving work assigned and escalates
81	Can be relied on to manage their work with little supervision and leads others
82	Self-motivated and deals with work / learning balance in a positive way
S18	**Understand the impact of work on others, especially where related to diversity and equality**
83	Works to the required standard of accuracy, neatness, and thoroughness. Often makes valued contributions to team quality.
84	Respects and encourages the value of others.
85	Usually tactful, considerate, and respectful in dealing with others.
86	Understands and adheres to the regulations relating to equality
S19	**Manage time effectively, being able to plan and complete work to schedule**
87	Continually demonstrates efficient use of work time, managing personal time considerately
88	Timekeeping and absence from work complies with company protocols
89	Always prepares in advance, ready to participate in group activities
S20	Able to handle change and respond to change management processes
90	Understand the principles of change management and how they apply to the direct place of work
91	Flexible, willing, and able to respond to changes in work situations and / or learn new skill
92	Works hard to implement successful change in areas of responsibility as directed by supervisor
93	Able to demonstrate examples of situations when they have changed practice or personal behaviour
S21	**Take responsibility for personal development, demonstrating commitment to learning and self-improvement**
94	Recognise areas for self-development and demonstrate personal awareness of strengths and weaknesses
95	Demonstrate self-directed learning to continually develop technical and transferable skills

A full list of the competencies can be found in the Work Based Learning Guide.

SIAS

Specialisms

In addition to the core competences specialisms are specific to a work context and need to be achieved by anyone being trained for a job role in that work context. The following specialisms are included:

- Laboratory Scientist – Analytical Science

- Laboratory Scientist – Chemical Science

- Laboratory Scientist – Research and Development

- Laboratory Scientist – Life Sciences

Std Ref	A	Laboratory Scientist – Analytical Science Specialism – Competencies
1, 2, 3	A1	Understand the theoretical basis for applied analytical science including how to apply analytical methods during design and implementation of analytical programmes, as appropriate
8	A2	Prepare for and perform analytical tasks using the appropriate scientific techniques, procedures, and analytical methods of relevance to the activities of the laboratory
11, 13	A3	Identify and use scientific approaches required to solve problems, support new investigations and follow-up experiments in the laboratory for routine and non-routine analytical tasks
8	A4	Understand the requirements for the development and validation of analytical methods and instrumentation, including understanding of suitable analytical sampling methods

Std Ref	B	Laboratory Scientist – Chemical Science Specialism – Competencies
1, 2, 3	B1	Understand the theoretical basis for applied chemistry including how to apply physical, organic, or inorganic chemistry during design and implementation of research programmes, as appropriate
8	B2	Prepare for and perform laboratory tasks using the appropriate chemistry techniques, procedures, and methods of relevance to the activities of the chemistry laboratory
11, 13	B3	Identify and use appropriate chemistry approaches required to solve problems, support new investigations and follow-up experiments in the laboratory for routine and non-routine tasks

Std Ref	C	Laboratory Scientist – Research & Development Specialism – Competencies
1, 2, 3	C1	Understand the theoretical basis for formulated product design including how to apply scientific methods during design and implementation of research programmes, as appropriate
8	C2	Prepare for and perform laboratory tasks using the appropriate scientific techniques, procedures, and methods of relevance to the activities of the formulation development laboratory
11, 13	C3	Identify and use scientific approaches required to solve problems, support new investigations and follow-up experiments in the laboratory for routine and non-routine, and new tasks

Std Ref	D	Laboratory Scientist – Life Sciences Specialism – Competencies
1, 2, 3	D1	Understand the theoretical basis for applied microbiology and biotechnology including how to apply scientific methods during design and implementation of research programmes where appropriate
8	D2	Prepare for and perform laboratory tasks using the appropriate scientific & microbial techniques, procedures, and methods of relevance to the activities of biotechnology laboratories
11, 13	D3	Identify and use scientific approaches required to solve problems, support new investigations and follow-up experiments in the laboratory for routine and non-routine, and new tasks

SIAS

Behaviours Evaluation Assessment Criteria

	Does Not Meet Expectation Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required	**Meets Expectations** Apprentice demonstrated an acceptable level of behaviour and meets the minimum level of behaviour expected	**Exceeds Expectations** Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices
Personal Responsibility	Demonstrate personal responsibility towards safety systems (incl. risk management and environment)		
Assessment Criteria	Little evidence of personal responsibility to safety systems.	Good personal responsibility towards safety systems.	Exhibits high standards of personal responsibility toward safety systems. Seeks to influence the behaviour of others.
	Tries to play down incidents in which they are involved.	Responds positively to suggestions for own improvements in personal responsibility for safety issues.	Actively monitors the safety of self and others, challenging and making suggestions where appropriate.
Communication	Communicate effectively using a full range of skills: speaking; listening; writing; body language; presentation; technical reports;		
Assessment Criteria	Misinterprets or is slow to comprehend oral and / or written instructions	Able to understand and present scientific / technical information to a range of audiences	Able to understand and explain complex information in a variety of formats and to a range technical and non-scientific audiences Scientific or technical publication (internally / externally)
	Communications are vague or poorly written or spoken. Difficulty conveying meaning to others.	Passes on information both verbal and written, in a way that is easily understood to a range of colleagues	Is able to adapt both verbal and written communication to be understood by different audiences (e.g., peer, supervisor, senior manager, and visitor).

SIAS

	Does Not Meet Expectation Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required	Meets Expectations Apprentice demonstrated an acceptable level of behaviour and meets the minimum level of behaviour expected	Exceeds Expectations Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices
			External technical and non-technical reports / presentation / publication.
	Will not ask questions and demonstrates little willingness to listen.	Listens and will question and challenge appropriately to enhance own understanding	Actively listens and challenges appropriately, in a range of internal / external audiences, to enhance own and others understanding Supports and acknowledges contributions from others
	Unable to effectively present personal viewpoint.	Able to effectively present personal viewpoint	Able to influence others to see personal viewpoint
	Unwilling to see other people's point of view	Receptive to other people's point of view.	Ability to reason from different points of view
Teamwork & Leadership	Works and interacts effectively within a team		
Assessment Criteria	Unwilling to contribute during team discussions / problem solving	Makes a useful contribution during team discussions / problem solving	Contributes and willing to lead team-based discussions / problem solving
	Can reduce morale and enthusiasm within the team	A good team member gets on well with colleagues at professional level building working relationships within team	Builds working relationships between team and other groups. Seeks to diffuse conflict situations where they arise
	Exhibits negative behaviour concerning team / organisational mission	Demonstrates knowledge and understanding of team organisation / mission	A strong team player helps bind the team together to achieve team mission / vision

	Does Not Meet Expectation Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required	Meets Expectations Apprentice demonstrated an acceptable level of behaviour and meets the minimum level of behaviour expected	Exceeds Expectations Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices
	Does not accept responsibility for own impact on team performance	Works cooperatively with others to achieve overall team goals	Puts team goals in line with personal achievement and recognition, actively contributes to achievements of others
	Does not take responsibility for work of others	Mentors colleagues to achieve technical objectives with successful feedback	Mentors colleagues and actively seeks feedback on scientific leadership style
Independence and Responsibility	Work independently and take responsibility for initiating and completing tasks		
Assessment Criteria	Inclined to wait for direction on work tasks Regularly needs to be told what to do or how to do it	Looks ahead and progresses work in areas of the job role, does not need to be told what to do next, completes tasks to timeframe required Will seek to resolve obstacles to achieving work assigned themselves before escalating	Demonstrates creative thinking to resolve obstacles and recommends improvements to existing processes and systems based on personal experience
	Supervision required to progress work	Holds themselves accountable for their own performance	Proactively seeks feedback to improve self-performance and mentors others and supports mentees performance
	Over reliance on supervisor for motivation	Self-motivated and deals with work / learning balance in a positive way	Maintains motivation and encourages others to do the same
Impact of Work	Understand impact of work on others, especially where related to diversity and equality		

	Does Not Meet Expectation Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required	Meets Expectations Apprentice demonstrated an acceptable level of behaviour and meets the minimum level of behaviour expected	Exceeds Expectations Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices
Assessment Criteria	Others feel the need to recheck their work or have to finish off the job after them. Work rarely makes a contribution to team quality	Has a reputation within the work group for doing work right first time, every time. Consistently makes valued contributions to team quality	Encourages right first time and quality in others
	Little respect for the values of others	Respects the value of others	Actively encourages work group to respect the values of others
	Has difficulty being tactful, considerate, and respectful in dealing with others	Usually tactful, considerate, and respectful in dealing with others	Always tactful, considerate, and respectful in dealing with others
Time Management	Accepts responsibility for managing own time and workload within a given plan to complete work to schedule		
Assessment Criteria	Does not deliver consistently, can waste time on non-essentials or can overcommit to deliverables	Continually demonstrates efficient use of work time and strives for improved productivity	Takes responsibility for managing time of others, is able to prioritise and doesn't over commit
	Unreliable timekeeping and absence from work	Timekeeping and absence from work complies with company protocols	Encourages others to comply with company timekeeping protocols
	Not fully prepared in advance holds up group activities	Prepares in advance ready to participate in group activities	Encourages others to prepare in advance for group activities
Change Management	Ability to handle change and respond to change management processes		
Assessment Criteria	Has difficulty adjusting to changes in workload or assignments	Is flexible, willing, and able to respond to changes in work situations and / or learn new skill	Capable of supporting others with change in work situations and / or learning new skill
	Resists change or innovation or takes a "wait and see" approach.	Works hard to implement successful change in areas of	Recommends changes to improve own work and work of

	Does Not Meet Expectation Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required	**Meets Expectations** Apprentice demonstrated an acceptable level of behaviour and meets the minimum level of behaviour expected	**Exceeds Expectations** Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices
		responsibility as directed by supervisor.	others and implements as agreed with supervisor.
	Does not value own contribution	Able to demonstrate examples of situations when they have changed practice or personal behaviour	Evidence of influencing / leading change and challenging practice or personal behaviour in others

SIAS

Further Information

For information about SIAS policies, quality assurance, re-sits, appeals, complaints and general enquiries please see our website: **www.siasuk.com**

or contact:

SIAS Assessment Services Officer – 01925515211 - **info@siasuk.com**

SIAS

Unit 5, Mandarin Court
Centre Park, WARRINGTON
WA1 1GG

T: 01925 515211
E: info@siasuk.com
W: www.siasuk.com