

SIAS

Apprenticeship standard

Laboratory Scientist (ST0626) Degree Apprenticeship Level 6

Work Based Learning Guide

December 2017



Purpose of document

This work based learning guide contains the detailed specification of the level of skills, knowledge and behaviours required to achieve occupational competence in the development phase of the Laboratory Scientist Degree Apprenticeship.

The work based learning guide has been developed by employers and will be maintained to reflect any future changes that are needed to maintain world class levels of quality and ensure that the credibility and consistency of the apprenticeship outcome is maintained. The apprenticeship outcome is described in Apprenticeship Standard Laboratory Scientist.

The mandatory assessment process that leads to the Apprenticeship award is available from info@siasuk.com.

Work Based Learning Guide – Laboratory Scientist L6

CORE COMPETENCES	
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	The underlying scientific principles, principal theories, concepts and terminology of laboratory based experimentation, including laboratory techniques relevant to the specialist discipline.
S2	The ways in which advanced science and technology is developed, established techniques of scientific enquiry and research methodologies.
S3	The theoretical basis for application of the science relevant to one specialist discipline including how to apply this during experimental design and implementation of research programmes.
1	On completion, apprentices will hold a BSc honours degree at Level 6, recognised by the Science Council 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	The requirements for the development and validation of analytical methods and instrumentation, including suitable sampling methods as appropriate to the specialist discipline.
2	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
S5	How to use statistical techniques, probability distributions, significance testing & confidence limits, regression & correlation and hypothesis testing to evaluate results, design experiments and draw evidence based conclusions.
S6	How to independently implement new processes according to the literature, data mining results and input from colleagues.
S7	How to initiate, plan, execute and close a project and incorporate the organisation’s project management procedures into the scientific work environment, working with team members
3	Understand the practical application of project management life cycle approaches to project identification, analysis of options through conducting scientific research, experimental design, and interpretation of results, drawing conclusion and recommendations that achieve the project aim
S8	The requirements of internal or external customers and how to recommend the appropriate workflows, improvements or scientific solutions.
4	Identify customer’s underlying needs (internal/external) and determine whether these needs can be addressed by a scientific approach
5	Identify operational constraints which could affect the scientific approach to meeting a customer’s requirements

Work Based Learning Guide – Laboratory Scientist L6

S9	The internal and external regulatory environment pertinent to the science sector and area of specialisation, for example Medicines & Healthcare Products Regulatory Authority (MHRA) , Control of Major Accident Hazards (COMAH), Good Laboratory Practice (GLP).
6	Understand 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 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))
S10	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
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)
CORE REQUIREMENTS: SKILLS	
S11	Identify and use the scientific approaches appropriate to one specialist discipline required to solve problems, support new investigations and follow-up experiments in the laboratory.
10	Demonstrate technical competence in the use of specified instruments and equipment, where appropriate developing subject matter expertise with a suitable technology
11	Identify and use scientific approaches required to solve problems, support new investigations and follow-up experiments in the laboratory for routine and non-routine tasks
12	Conduct laboratory experiments, tests or tasks, designing methodologies to provide reliable, accurate data using a range of scientific approaches and techniques
S12	Appraise scientific experimentation, independently design and implement new processes according to relevant literature and other data sources interrogated using data mining techniques and input from colleagues.
13	Identify and critically evaluate relevant scientific information from appropriate technical resources e.g. databases, scientific literature, and challenge assumptions in order to develop novel solutions
14	From research apply learned models and concepts to analyse situations, contribute to ideation
S13	Support appraisal of scientific experimentation with numerical and statistical analysis.
15	Understand the principles behind valid analytical measurements, method performance characteristics, uncertainties in analytical results and method verification/validation
S14	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.

Work Based Learning Guide – Laboratory Scientist L6

16	Prepare scientific and technical reports <i>to a level commensurate with the expectations of the job role</i>
17	Use statistics in experimental designs to enable the effective measurement of the experimental variables and their interaction
18	Practical demonstration of one or more problem solving techniques
19	Demonstrate the use of advanced statistical analysis techniques for evaluation of results and data presentation to a technical audience
S15	Comply with regulations including compliance with business rules pertaining to record keeping, data integrity, traceability & confidentiality.
20	Use relevant good laboratory documentation practices keeping accurate records of laboratory work undertaken, analysis of results and conclusions drawn
21	Apply the principles behind valid analytical measurements, method performance characteristics, uncertainties in analytical results and method verification/validation
S16	Promote and ensure the application of quality standards, safe working practices and compliance with risk management systems relevant to the workplace in own work and the work of others.
22	Promote and apply company quality procedures to meet the requirements of quality standards relevant to the workplace
23	Within the laboratory environment, promote safe working practices and challenge behaviour when something has not been carried out correctly by colleagues and explain the impact this could have
24	Detailed understanding of risk management systems and their application to safe working practices in the laboratory environment.
25	Perform internal auditing in support of local quality policies, raise and allocate corrective actions and close designated tasks to time
S17	Use creative thinking and problem solving techniques such as root cause analysis, to challenge assumptions, innovate, make new proposals and build on existing ideas.
26	Propose new or unusual approaches to existing problems, testing the hypothesis with critical evaluation of the results
27	Challenge underlying assumptions and established ways of working
S18	Autonomously plan and prioritise tasks, review and evaluate progress against objectives and investigate alternative scenarios.
28	Proficient in project management tools and techniques, including software packages pertinent to the role and techniques used within the industry
S19	Contribute to the development of specific technical projects across multi-disciplinary teams.
29	Manage the communication requirements of project management including the tools for stakeholder management
30	Identify and develop hypothesis from relevant scientific information to address customer needs and agree appropriate performance criteria with the customer
31	Demonstrate professional interaction with customers, using solicited feedback for self-directed learning and personal improvement
32	Drive project contingency planning

Work Based Learning Guide – Laboratory Scientist L6

S20	Ensure that targets are met and maintained, within own area of responsibility, whilst complying with defined company procedures and legislative requirements.
S21	Lead continuous performance improvement within the scientific and technical environment using process mapping & analysis and root cause analysis that is informed by other appropriate principles, such as lean, six sigma, project and change management.
33	Understand and apply root cause analysis
34	Project lead of a continuous improvement project that delivers recognised efficiencies within own workspace
35	Apply workplace organisation techniques to improve workflow of the laboratory
36	Demonstrate use of one or more continuous improvement techniques in managing own work and to impact on the work of others <ul style="list-style-type: none"> • Workplace organisation techniques • Management strategies such as 'Lean' or 'Six Sigma' • Reduction of 'waste' • Internal auditing process
	Behaviours:
S22	Communicates effectively to a scientific and non-scientific audience using oral presentation, scientific debate & technical writing skills.
37	Readily comprehends oral and/or written instructions when first presented and able to present scientific/technical information to a range of audiences
38	Passes on information both verbal and written, in a way that is easily understood to a wider technical team
39	Listens and will question and challenge appropriately to enhance own understanding
40	Able to effectively present personal viewpoint and influence others within the team
41	Receptive to other people's point of view
42	Take part in technical presentations to a scientific audience both within the workplace and external to the area of expertise
43	Participate in community or academic projects to promote science to a non-technical audience (internal/external)
44	Present technical poster, abstract and formal written scientific poster to an appropriate audience (internal/external)
S23	Demonstrates reliability, integrity and respect for confidentiality on work related and personal matters, including appropriate use of social media and information systems.
45	Understand confidentiality policies within the work place and know how to apply them
46	Appropriate use of social and business media within the workplace and understand application of company policies
47	Adhere to company Information Technology policies including appropriate use of e-mail and professional electronic communication

Work Based Learning Guide – Laboratory Scientist L6

48	Adhere to document security classification and understand the control requirements for technical/scientific publications, e.g. internal and external reports and presentations
S24	Works autonomously and interacts effectively including challenging assumptions within a wide, multi-disciplinary project team.
49	Make useful contribution during wider team discussions and initiates problem solving
50	Demonstrates knowledge and understanding of team organisation/mission and how this fits into the sector
51	Works cooperatively with others to achieve overall team goals and understands how these influence the wider organisation
52	Works autonomously, can be trusted to complete tasks and identifies obstacles to achieving work assigned and escalates where required
53	Can be relied on to manage their work with little supervision and leads others
54	Self-motivated and deals with work/learning balance in a positive way
55	Actively monitor the safety and quality of self and others, challenging and making suggestions where appropriate
S25	Takes account of the impact of work on others, especially where related to diversity and equality.
56	Works to the required standard of accuracy, neatness and thoroughness. Often makes valued contributions to team quality
57	Respects and encourages the value of others
58	Usually tactful, considerate and respectful in dealing with others
59	Understands and adheres to the regulations relating to equality
S26	Manages time effectively, being able to plan and complete work to schedule.
60	Continually demonstrates efficient use of work time, managing personal time considerately
61	Timekeeping and absence from work complies with company protocols
62	Always prepares in advance, ready to participate in group activities
S27	Responds positively to change management processes and promotes change within work group.
63	Understand the principles of change management and how they apply to the direct place of work
64	Flexible, willing and able to respond to changes in work situations and/or learn new skill
65	Works hard to implement successful change in areas of responsibility as directed by supervisor
66	Able to demonstrate examples of situations when they have changed practice or personal behaviour
67	Recommends changes to improve own work and work of others and implements as agreed with supervisor
68	Influences/leads change and challenges practice or personal behaviour in others

Work Based Learning Guide – Laboratory Scientist L6

S28	Takes responsibility for continuing personal and professional development, demonstrating commitment to learning and self-improvement and supports the development of others as appropriate.
69	Recognise areas for self-development and demonstrate personal awareness of strengths and weaknesses
70	Demonstrate self-directed learning to continually develop technical and transferable skills