

SIAS

Apprenticeship Standard

Laboratory Technician

Work Based Learning Guide

September 2016



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 Apprenticeship Laboratory Technician.

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 Technician.

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

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CORE COMPETENCES	
Std Ref	Competences that need to be achieved by anyone being trained for the occupation. All elements are mandatory except those marked as optional , which should be included only when required for a specific job role or sector
S1	Work safely in a laboratory, maintaining excellent housekeeping whilst following appropriate safety, environment and risk management systems.
S2	Understand and follow quality procedures to meet the requirements of quality standards relevant to the workplace.
S3	Understand the internal and external regulatory environment pertinent to the sector and the employer and comply with regulations proficiently.
	General workplace Health and Safety
1	Understand and comply with foundations of health and safety including responsibility for health and safety under HASWA
2	Understand the procedures for first aid relevant to your workplace
3	Understand and comply with risk assessment & control including Control of Substances Hazardous to Health assessments, where appropriate and Safety Data Sheets
4	Demonstrate appropriate use of personal protective equipment e.g. face mask, fume hood
5	Understand and practice fire and electrical safety procedures in the workplace
6	Understand and practice safe manual handling and repetitive activities, including DSE
7	Understand Hazardous area classification & DSEAR regulations and how they apply within area of responsibility, where appropriate
8	Understand and comply with site and local emergency procedures
9	Understand and comply with relevant organisation safety policies and procedures
	Laboratory Safety & Housekeeping
10	Work safely in a laboratory and follow aseptic laboratory procedures where required
11	Maintain excellent housekeeping, in accordance with organisation Standard Procedures
12	Able to deal appropriately with laboratory spillages
13	Order and control stocks of laboratory materials where required
14	Understand and follow risk assessments
15	Understand and comply with laboratory health and safety and compliance with legal, regulatory, ethical requirements
	Environmental Management
16	Understand the management and control of laboratory waste
17	Understand the handling and disposal of chemical substances

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18	Understand environmental risk assessments (impact assessment)
19	Understand and apply the concepts of resource efficiency to energy, water and waste
	Quality
20	Understand and follow quality procedures to meet the requirements of quality standards relevant to their work
	Regulatory Environment
21	Understand and adhere to the internal regulations pertinent to the sponsoring company & relative specialism in which they operate (eg. Good Laboratory Practice, Good Manufacturing Practice, Good Documentation Practice)
22	Understand and adhere to the external regulatory requirements pertinent to the sponsoring company & relative specialism in which they operate (e.g. COMAH, MHRA, FDA, ONR, Animal Scientific Procedures Act 1986 and Directive 2010/63/EU (ETS123 Guidelines))
S4	Prepare for laboratory tasks using the appropriate scientific techniques, procedures and methods.
S5	Perform laboratory tasks following specified methodologies, such as Standard Operating Procedures.
S6	Demonstrate technical competence in the use of specified instrumentation and laboratory equipment, including calibration where required.
S7	Produce reliable, accurate data and keep accurate records of laboratory work undertaken and results
23	Understand and apply a variety of documents such as Standard Operating Procedures and Test Procedures
24	Prepare for, and perform, laboratory experiments, tests or tasks following any specified methodologies to provide reliable, accurate data e.g. <ul style="list-style-type: none"> • Basic laboratory techniques e.g. weighing, pipetting, filtering • Spectroscopic techniques • Titrimetric techniques • Thermochemical techniques • Chromatography techniques
25	Understand the reasons for and apply a variety of safety management systems such as Standard Operating Procedures and Risk Assessment
26	Demonstrate technical competence in the use of specified instruments and equipment
27	Report faults and seek diagnostic advice to maintain equipment in good working order, including calibration where required
28	Complete documentation proficiently including relevant calculations
29	Understand the reason for laboratory investigations including out of specification results
30	Understand error reporting and correction techniques e.g. for traceability

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31	Demonstrate an understanding of the relevant good documentation practices	
32	Keep accurate records of laboratory work undertaken and results	
33	Contribute to the preparation of reports to a level commensurate with job role	
S8	Analyse, interpret and evaluate data and identify results requiring further investigation seeking advice of senior colleagues as appropriate	
S9	Understand and apply statistical techniques for data presentation.	
S10	Communicate scientific information appropriately, including the use of Laboratory Information Management systems, either digital or paper based.	
34	Demonstrate use of simple statistical techniques for data presentation and evaluation	
35	Practical demonstration of one or more problem solving techniques	
36	Demonstrate identification of sources of error and how they can be reduced e.g. human error	
37	Demonstrate basic skills in the use of standard software packages and applications	
38	Understand and demonstrate the application of the principles of the use of Laboratory Information Management systems digital or paper based	
S11	Recognise problems and apply appropriate scientific methods to identify causes and achieve solutions.	
39	Understand and apply basic root cause analysis	Optional
40	Address non-routine problems with samples and instrumentation, within defined areas	
41	Identify relevant information from appropriate scientific sources e.g. supervisors, literature etc. in order to contribute to solutions	
S12	Participate in continuous performance improvement.	
42	Participate in improving systems and processes within your work environment or demonstrate where you have personally improved and become more efficient	
43	Understand how workplace organisation techniques can be applied to improve workflow of the laboratory	
44	Demonstration of one or more continuous improvement techniques e.g. <ul style="list-style-type: none"> • Workplace organisation techniques • Accreditation (e.g. ISO, UKAS) • Proficiency 	Optional
S13	Develop and apply theoretical knowledge of relevant science and technology required for the sector & job role.	
45	Theoretical knowledge of chemical science, materials science, analytical science or applied bioscience as required for the sector & job role	
S14	Understand the business environment in which the company operates including personal role within the organisation, ethical practice and codes of	

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	conduct.
46	Understand the business environment (customers, competitors etc.) in which the organisation operates
S15	Demonstrate the required attitudes, behaviours and interpersonal skills associated with the professional workplace
	To meet Behaviours Evaluation Assessment Criteria

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 technician – Life Sciences R&D
- Laboratory Technician - Animal Science
- Laboratory Technician – Coatings

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Std Ref	A	Laboratory Technician – Life Sciences R&D Specialism – Competences
S4	A1	Prepare for, and perform laboratory experiments and tests to produce reliable, accurate data to support R&D projects
S8	A2	Make recommendations for further investigations subsequent to the analysis, interpretation and evaluation of data with R&D colleagues
S3	A3	Understand good clinical practice and other good practice for clinical trial research

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Std Ref	B	Laboratory Technician - Animal Science (Species may vary depending on species held at workplace) Specialism – Competences
S4,5,6,7	B1	Handle laboratory animal species and perform general husbandry practices in accordance with company Standard Procedures e.g. changing of cages, feeding, watering and provision of environmental enrichment, perform daily health checks, weighing
S4,5,6,7	B2	Perform regulated procedures for species e.g. basic administration routes e.g. oral, subcut, intravenous, intranasal, intraperitoneal
S4,5,6,7	B3	Demonstrate correct use of equipment e.g. syringes / needle size appropriate for species being dosed
S4,5,6,7	B4	Perform recognised methods of euthanasia i.e. schedule 1 methods
S4,5,6,7	B5	Perform routine sampling methods suitable for species e.g. blood sampling via cardiac puncture, tail vein, urine collection
S4,5,6,7	B6	Perform routine methods of identification suitable for species e.g. ear marking, tail marking, microchipping
S4,5,6,7	B7	Perform tissue collection at necropsy e.g. tumours, blood, spleens, lymph nodes, femurs, lung/lung inflation, heart, liver, spinal column/spinal cord
S13	B8	Understand the use of chemicals within an animal facility and the purpose of facility hygiene
S13	B9	An understanding of the use of small/large molecules in the treatment of disease appropriate to the therapeutic areas supported in the workplace
S3	B10	The requirements of Animal Scientific Procedures Act 1986; Directive 2010/63/EU, including responsibilities of the Named Persons and AWERB
S4,5,6,7	B11	Formulation – be able to prepare solutions/suspensions for administering to laboratory animals e.g. use of gilsons pipettes
S 4,5,6,7	B12	Demonstrate interactions with appropriate “Named” individuals in relation to Animal Welfare
S 4,5,6,7	B13	Administer and maintain anaesthesia for species at workplace, demonstrate understanding of choice of anaesthetics used
S 4,5,6,7	B14	Surgical procedures – be able to perform surgical procedures under aseptic conditions e.g. blood vessel cannulation, implantation of mini pumps, implantation of cancer cells into organs
S 4,5,6,7	B15	Behavioural assessments e.g. phenotyping of transgenic mouse line
S 4,5,6,7	B16	Breeding of transgenic mice – demonstrate a basic understanding of breeding regimes i.e. trio matings and breeding tasks e.g. mating, littering, weaning, taking of genotyping samples
S13	B17	Basic understanding of genetics used in the breeding of transgenic mice i.e. homozygous, heterozygous, wild type litter mates
S13	B18	Understanding of transgenic breeding terms i.e. speed congenics, knock outs, knock ins, rederivation, cryopreservation
S 4,5,6,7	B19	Understanding of facility plant, air handling units, pressure differentials and species specific environmental conditions and how these are obtained
S13	B20	Understanding of facility barrier requirements and procedures that can be used to maintain a barrier facility

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Std Ref	B	Laboratory Technician - Animal Science (Species may vary depending on species held at workplace) Specialism – Competences
S3	B21	Understanding of AAALAC accreditation process
S13	B21	Recognition of signs of ill health, adverse reactions to treatments, pain and distress in species used at workplace
S13	B23	Principles of 3Rs and applications within the workplace
S13	B24	Principles of sentinel monitoring and health status of laboratory animals
S3	B25	The individual must acquire Home Office Personal Licence

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Stnd Ref	C	Laboratory Technician – Coatings Specialism – Competences
S1 (22)	C1	Understand industry health and safety appropriate to the handling and use of sector specific raw materials and the use of the equipment including: <ul style="list-style-type: none"> • Understanding and use of control measures including storage, PPE (appropriate to the sector specific materials)
S3	C2	Understand the key legislative drivers for the coatings industry as appropriate e.g. COSHH, REACH, process guidance notes (PG notes covering sectors), EU Product Directive 2004\42\EC, ISO Standards
S1, 2, 4, 5	C3	Understand and demonstrate practical competence of one or both of the following techniques: <ul style="list-style-type: none"> • Clean and safe handling and measuring of raw materials • Preparation of samples, including measuring, solution, dispersion and classification
S6	C4	Demonstrate technical competence in the use of specified instrumentation and laboratory equipment, for example: <ul style="list-style-type: none"> • Quality control equipment • Quality assurance equipment • Dispersion equipment • Colour measurement equipment • Application equipment
S2, 5	C5	Understanding and application of industry relevant test methodologies including use of and appreciation of appropriate quality control parameters
S11, 13	C6	Develop and apply theoretical knowledge of relevant science and technology for all of following that apply: <ul style="list-style-type: none"> • Formulation principles • Colour chemistry • Resin/polymer chemistry • Additive chemistry • Pigment chemistry • Solvents • Product drying and curing • Fundamentals of film formation • Substrates • Surface pre-treatment • Mechanisms of corrosion and surface protection • Paint and ink faults and remedies: <ul style="list-style-type: none"> – Prior to application

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Stnd Ref	C	Laboratory Technician – Coatings Specialism – Competences
		<ul style="list-style-type: none"> – At the time of application – In service and their consequences
S14	C7	Have commercial awareness of cost and cost-effective solutions to technical challenges or areas under development

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Behaviours Evaluation Assessment Criteria

	Does not meet Expectation <i>Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required</i>	Meets Expectation <i>Apprentice demonstrated acceptable level of behaviour and meets the minimum level of behaviour expected</i>	Exceeds Expectation <i>Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices</i>
Personal Responsibility:	<i>Demonstrate personal responsibility towards safety systems (incl. risk management and environment)</i>		
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:	<i>Communicate effectively using a full range of skills: speaking; listening; writing; body language; presentation</i>		
Assessment criteria	Misinterprets or is slow to comprehend oral and/or written instructions.	Readily comprehends oral and/or written instructions when first presented.	Superior comprehension of oral and/or written instructions. Checks back to avoid any misunderstanding.
	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	Is able to adapt both verbal and written communication to be understood by different audiences (e.g. peer, supervisor, senior manager, and visitor).
	Will not ask questions and demonstrates little willingness to listen.	Listens and will question and challenge appropriately to enhance own understanding.	Listens and questions to enhance own and others understanding. Supports and acknowledges contributions from others.

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	Does not meet Expectation <i>Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required</i>	Meets Expectation <i>Apprentice demonstrated acceptable level of behaviour and meets the minimum level of behaviour expected</i>	Exceeds Expectation <i>Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices</i>
	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.
Team Work	<i>Work and interact effectively within a team</i>		
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.	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/organisation mission.
	Does not accept responsibility for own impact on team performance.	Works cooperatively with others to achieve overall team goals.	Puts team goals ahead of personal achievement and recognition.
Independence and Responsibility:	<i>Work independently and take responsibility for initiating and completing tasks</i>		
Assessment criteria	Inclined to wait for direction on work tasks. Regularly needs to be told what to do or how to do it.	Normally does not need to be told what to do next, can be trusted to complete tasks. Identifies obstacles to achieving work assigned and escalates.	Looks ahead and progresses work in areas of the job. Will seek to resolve obstacles to achieving work assigned themselves before escalating.

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	Does not meet Expectation <i>Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required</i>	Meets Expectation <i>Apprentice demonstrated acceptable level of behaviour and meets the minimum level of behaviour expected</i>	Exceeds Expectation <i>Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices</i>
	Supervision required to progress work.	Can be relied on to manage their work with little supervision.	Holds themselves accountable for their own 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:	<i>Understand impact of work on others, especially where related to diversity and equality</i>		
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.	Works to the required standard of accuracy, neatness and thoroughness. Often makes valued contributions to team quality.	Has a reputation within the work group for doing jobs right first time, every time. Consistently makes a valued contribution to team quality.
	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	<i>Accepts responsibility for managing own time and workload within a given plan to complete work to schedule</i>		
Assessment criteria	Does not deliver consistently and can waste time on non-essentials.	Continually demonstrates efficient use of work time.	Continuously strives for improved productivity.

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	Does not meet Expectation <i>Apprentice failed to demonstrate an acceptable level of behaviour. Improvement is required</i>	Meets Expectation <i>Apprentice demonstrated acceptable level of behaviour and meets the minimum level of behaviour expected</i>	Exceeds Expectation <i>Apprentice demonstrated consistent and positive behaviours in this area that reflect those expected of outstanding apprentices</i>
	Unreliable timekeeping	Timekeeping complies with company protocols.	Encourages others to comply with company timekeeping protocols.
	Not fully prepared in advance holds up group activities.	Always prepares in advance ready to participate in group activities.	Encourages others to prepare in advance for group activities
Change Management:	<i>Ability to handle change and respond to change management processes</i>		
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 responsibility as directed by supervisor.	Recommends changes to improve own work and work of 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 change of practice or personal behaviour by others.