

DAY 1 SKILLS FOR THE LABORATORY ANIMAL TECHNOLOGIST

1. Generic competencies, personal learning and thinking skills

Communication

- a) Communicate effectively using visual, mathematical and/or language skills* using verbal and/or written presentation.
- b) Communicate effectively with staff, researchers, students, the public, colleagues and relevant authorities

Participation

Effectively and constructively participate by joining in, becoming involved, and taking a constructive and active part with others

Teamwork

Work effectively with others as a member of a departmental team, research team, organisation, or community.

Self-management

- a) Accept accountability and responsibility for one's own actions
- b) Organise and manage oneself and one's activities responsibly and effectively
- c) Ensure that your work area /office space is maintained in a tidy, clean and hygienic condition
- d) Ensure that all paperwork is managed in a tidy, clean, up to date and well-filed system
- e) Ensure that all computer files are managed and up to date in a well-filed system
- f) Ensure that all data is recorded immediately and legibly in accordance with good quality management practice and raw data management. That all data is valid, reliable, authentic and sufficient
- g) Ensure that performance is efficient and effective
- h) Ensure that all work is undertaken in compliance with local Standard Operating Procedures, organisational policy and procedure, national standards and legislation

Independent enquiry

Collect, analyse, organise and critically evaluate information.

Creative thinking and reflective learning

- a) Identify and solve problems in which the responses demonstrate that responsible decisions using critical and creative thinking have been made.
- b) Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

- c) Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- d) Be committed to personal career development, maintaining competence and continuous professional development (CPD)

2. Functional skills*

- a) Note: these specify entry requirements
- b) Grade 12 or equivalent
- c) English Grade 12 or equivalent (write and read English effectively)
- d) Mathematical literacy (e.g. be able to calculate drug dosages and volumes)

3. Maintain biosecurity, personal hygiene, health and safety and security

- a) Select and use the personal protective equipment (PPE) provided, which are appropriate to your daily routine or to the specific task you are performing
- b) Behave in a way which minimises the risk to yourself, others and to the animals
- c) Use equipment and chemicals in accordance with manufacturers' instructions
- d) Adhere to organisational health and safety regulations, procedures and policies
- e) Be aware of what to do in the case of a breach of security / fire / medical incident / accident; and how to report the incident immediately
- f) Take precaution against the transmission of diseases including zoonosis
- g) Maintain security of the workplace
- h) Dispose of various types of waste material (hazardous, toxic, biological, medical, biohazardous) appropriately and safely
- i) Deal with any chemical spillage safely and appropriately: report the incident

4. Handle, move and restrain animals

- a) Wear the necessary personal protective equipment (PPE)
- b) Determine the location and the animal to be moved
- c) Approach animals calmly, quietly and confidently
- d) Identify the sex of the animal(s)
- e) Identify the animal(s)
- f) Carefully remove the animal(s) using correct handling techniques
- g) Animal species that should be competently handled and restrained include those listed in Table 1.
- h) Remove / replace any cage labels, ensuring information is correct
- i) Ensure the new accommodation is appropriate (observe the animal(s) behaviour; especially when re-grouping the animals to ensure compatibility of individuals) and allow sufficient acclimatisation period to new environment
- j) Record the date and sign for tasks
- k) Be able to remove the animal (firstly ensuring its identification) and be able to apply appropriate, gentle and safe restraint, such as to assist in a minor procedure
- l) Be able to use acceptable and appropriate restraint equipment to gently and safely restrain the animal

- m) Record the date and sign for tasks

5. Dispatch, transport and receipt of animals

- a) The transport of animals include:
 - Transport over short distance
 - Transport between animal rooms in the same building
 - Transport between buildings in the same institution
 - Transport between institutions, by road
- b) Check the details on the animal request form
- c) Check research protocol number for animals dispatched for research
- d) Confirm that the animals are available
- e) Arrange for collection
- f) Prepare the correct transport boxes, including bedding and transport medium
- g) Move animals carefully to the transport box, avoid mixing sexes and mixing incompatible groups of animals in one box
- h) Ensure the transport boxes are secured
- i) Complete all the necessary paperwork, the final dispatch form should be signed
- j) Use reliable and fit for purpose transport for the animals
- k) Pre-prepare appropriate animal accommodation
- l) Upon receipt of the animals, check all the details on the delivery paperwork
- m) Remove the animals one by one from the transport box into the new accommodation
- n) Check for signs of discharge in the transport box; check each animal for any injuries, or signs of disease. Report any problems immediately.
- o) Demonstrate an understanding of the impact of transport on animals including acclimatisation
- p) Provide the new arrivals with fresh water and diet immediately
- q) Complete the animal arrival paperwork

6. Receipt, storage and providing bedding / nesting material; food and water to animals

- a) Monitor and manage the storage conditions of animal diet and report any problems, both in the storage conditions and in the storage bins
- b) Receive newly delivered diet / bedding. Check details of diet type and quantity. Check condition of diet / bedding bags and report any problems, such as mould or pest infestation, or foreign matter.
- c) Handle diet bags so as not to cause damage and ensure rotation of diet in store. Record batch number deliveries and expiry dates, maintain stock records, including delivery date and your signature (or as required by local standard operating procedures).
- d) Ensure you select the correct diet / bedding material for the species, age and reproductive status of animal
- e) Ensure there is always sufficient good quality diet provided for the number of animals in the cage / pen
- f) Ensure there is always sufficient good quality clean bedding provided for the number of animals in the cage / pen
- g) Ensure there is always sufficient clean, fresh potable water provided for the number of animals in the cage / pen

- h) Monitor and maintain all feeding and watering equipment in a clean and fit for use state
- i) Note and report any changes in the feeding / drinking habits of the animals
- j) Note when conducting a cage-clean, and report any abnormalities such as the presence of blood, diarrhoea
- k) Dispose of waste food and bedding correctly
- l) Be able to monitor, record and calculate food and / or water consumption

7. Care, husbandry, hygiene and management of laboratory animals

- a) Demonstrate an understanding of the SANS 10386 document at all times for individual species requirements, including minimum space requirements
- b) Perform the husbandry and care of:
 - Rats, mice, guinea pigs, rabbit and fish (theoretical and practical experience is required in all these species)
 - Large animals for example dogs, cats, sheep, goats, pigs, chickens, primates; with practical experience of at least one (husbandry included species specific behaviour, housing requirements, handling requirements, social requirements, nutrition and care in the captive environment, grooming)
- c) Perform species specific hygiene management
- d) Demonstrate an understanding of cage cleanliness on the health and well-being of animals
- e) Animal accommodation should include group housing and single housing
- f) Animal accommodation should include various types of caging, large animal pens and specialised caging such as individually ventilated cages (IVCs) and isolators
- g) Maintain the correct macro and micro environmental conditions for the animal(s) especially for caged animals
- h) Prepare and check fixtures and fittings such as food hoppers, water bottles, and water bowls
- i) Provide the correct nutrition for the animal(s)
- j) Provide adequate quality water to the animal(s)
- k) Demonstrate an understanding of the impact of nutrition and water quality on research
- l) Provide different types of bedding material to different animal species
- m) Provide the correct nesting material for the animals
- n) Provide environmental enrichment to the different animal species
- o) Wear appropriate personal protective equipment; take appropriate health and safety precautions for yourself and others
- p) Prepare clean animal accommodation in accordance with that particular species' needs. Including appropriate bedding and environmental enrichment materials. Move animals from soiled accommodation to clean accommodation, including the use of cage-changing stations as appropriate
- q) Use correct and safe handling techniques appropriate to the species and age of the animal
- r) Ensure any cage labels are correctly transferred and securely attached to clean accommodation
- s) Ensure the animals are secure in their clean accommodation and observe that they are displaying normal behaviour

- t) Ensure the recommended stocking density for the species and the size of cage are complied with (South African National Standards (SANS) 10386)
- u) Discard all waste in an appropriate manner
- v) Remove soiled caging material, hoppers, water containers, environmental enrichment objects in an appropriate manner to the correct location for sanitisation
- w) Sanitise / disinfect / sterilise working area, including animal room floors as appropriate once cage changing has been completed
- x) Routinely and appropriately wash / disinfect / sterilise all animal room accommodation, food hoppers, water bottles and environmental enrichment equipment. Including the use of specialised equipment and chemicals
- y) Routinely and appropriately wash / disinfect / sterilise all animal cage-racking
- z) Record the time and sign for completion of all tasks

8. Ancillary animal facility areas

- a) Ancillary areas include all areas in the animal facility which are not animal rooms
- b) Ensure that clean and dirty items are kept separate and stored correctly
- c) Ensure that all these areas are maintained in a tidy, clean and sanitised condition at all times; especially at the end of each working day.
- d) Ensure that cleaning equipment is maintained in a clean and sanitised condition at the end of each working day.
- e) Ancillary areas include, *Inter alia*, entrance and exit lobbies (for staff and goods), waste areas, showers, toilets, store rooms (including food, bedding, consumables, cages, etc.), cage and bottle wash areas, corridors, tea room and office

9. Maintenance of equipment and stores

- a) Maintain all equipment clean and in working condition at all times
- b) Ensure correct servicing, maintenance and calibration of all equipment and animal room services
- c) Ensure that all servicing, maintenance and calibrations are recorded and records maintained up to date and in order
- d) Ensure that animal diet and consumables are ordered timeously
- e) Maintain a record of all stores
- f) Maintain all storage areas in a tidy and clean manner

10. Monitor and maintain the health and welfare of laboratory animals

- a) Meet your legal and moral responsibility to the animals at all times
- b) Maintain the health and welfare of animals in your care at all times
- c) Be committed to the practice of the 3Rs principles (Replacement, Reduction, Refinement) (Russell, W.M.S. and Burch, R.L., (1959). *The Principles of Humane Experimental Technique*, Methuen, London)
- d) Check at appropriate frequency to identify any deaths (mortality check)
- e) Dispose of the carcass according to recommended guidelines
- f) Record any deaths, date and sign; and report the death to the appropriate person

- g) Care for the animals in a way which is likely to lead to meaningful and accurate scientific research results or efficient breeding programmes
- h) Recognise potential hazards to the animals, take appropriate action and suggest ways to make improvements in animal care and welfare
- i) By observing the various species (listed in Table 1) of laboratory animal(s), undisturbed, housed singly or in a group, be able to recognise the difference between normal behaviour and abnormal behaviour.
- j) Be able to recognise pain, suffering and distress in the different species (listed in Table 1).
- k) Be able to recognise and manage common laboratory animal diseases
- l) Be aware of the risk of zoonotic diseases, in all animal species and especially in primates
- m) Manage health monitoring programmes, including sentinel management
- n) Manage cage cleanliness, realising the impact on animal health and well-being
- o) Check at appropriate frequency to identify signs of pain, suffering or distress, and take appropriate action when abnormalities are detected.
- p) Record observations, date and sign; and know to whom to report such problems

11. Check the physical condition of a laboratory animal by performing a full systematic clinical observation

- a) To be able to recognise what is abnormal in an animal you must be familiar with what is normal for each species (listed in Table 1)
- b) Check the animal accommodation for signs of blood or other discharge
- c) Regularly check the physical condition of the animal
- d) Regularly monitor and record the body weight of each animal as per local standard operating procedures and ethics committee approved protocols
- e) Be able to create a growth curve
- f) Record, date, time and sign appropriate records
- g) Know who to report any serious deviations from normal to, and do so timeously
- h) Restrain the animal safely and securely, according to recommended guidelines, minimising stress to the animal
- i) Examine the animal thoroughly, using a systematic process (from tip of nose to tip of tail)
- j) Record the findings, date, time and sign
- k) Know who to report any deviations from normal to, and do so timeously
- l) It may be necessary to check other clinical parameters such as body temperature.
- m) Record, date, time and sign appropriate records
- n) Know who to report any deviations from normal to, and do so timeously
- o) Be able to recognise common laboratory animal diseases and report to veterinarian

12. Animal room and barrier management

- a) Constantly manage the animal room for cleanliness, hygiene and disinfection, maintaining optimal animal room sanitisation at all times
- b) Be able to sanitise and disinfect an animal room; using specialised equipment, and appropriate chemicals

- c) Assist with animal room sterilisation
- d) Operate an autoclave and confirm successful sterilisation
- e) Maintain the integrity of the animal room barrier at all times
- f) Understand and correctly apply the principles of biocontainment and bio exclusion
- g) Understand biosafety level classifications and different levels of biosecurity required
- h) Use the correct procedures at all times, prior to entry / exit from any animal room
- i) Use the correct procedures for entry / exit of materials and personnel across the barrier
- j) Recognise an emergency that may affect the integrity of the barrier, and report it immediately. Record problem. Take appropriate emergency action.
- k) Monitor and record animal room environmental parameters, including room temperature, relative humidity and differential air pressures on a daily basis
- l) Monitor and record the cage environment where the animals' direct accommodation environment may differ from the room environments, such as in IVCs
- m) Record and sign for these environmental parameters
- n) Where animal room or direct animal accommodation environment parameters fall outside of acceptable recommended limits, know how to record this, and to whom to report any problems and follow up (South African National Standards (SANS) 10386).
- o) Routinely monitor and record light cycles, light intensity, ventilation rates
- p) Method of entering and exiting a BSL2 and BSL3 facility. Be able to work appropriately under BSL2 and BSL3 laboratory conditions

13. Animal identification

- a) Be aware of the various identification methods of laboratory animals and their use in various species
- b) Be able to apply non-invasive animal identification such as non-toxic dyes, photographs, use of coat colouring where appropriate
- c) Assist with the application of invasive animal identification such as ear notching and micro-chips, where appropriate
- d) Be able to correctly identify an animal from the various methods that may be used for identification in various species
- e) Be able to correctly identify animal accommodation

14. Laboratory animal breeding and colony management

- a) Manage appropriate barrier conditions for animal breeding colonies
- b) Demonstrate practical application and understanding of animal genetics
- c) Demonstrate a practical application and understanding of Mendelian hereditary
- d) Demonstrate a practical application and understanding of reproductive physiology
- e) Select breeding stock for specific outcomes, including different animal models
- f) Demonstrate a practical understanding of genetic drift and genetic quality control

- g) Assist with the management of breeding programmes and colony size management.
- h) Manage colony size with regards to supply and demand
- i) Calculate the number of breeding pairs to use, in order to supply sufficient numbers of animals, without significant overbreeding (i.e. wastage).
- j) Prepare accommodation conditions suitable for breeding
- k) Select breeding animals as per instructions
- l) Monitor and maintain animal care and husbandry without unduly disturbing the animals; provide nesting material when female is close to parturition
- m) Make up breeding groups as per instructions
- n) Assist with palpating for pregnancy where appropriate
- o) Monitor and record animal health during pregnancy
- p) Observe breeding animals regularly without undue disturbance
- q) Record observations, report any problems to the correct person
- r) Record the date of birth and the number of animals born as well as deaths or still births
- s) Care for the mother and the young – be aware of special nutritional requirements
- t) Observe animals during parturition, record and report any problems to the correct person
- u) Wean and correctly sex animals at appropriate age
- v) Care for the new-born animals including social grouping
- w) Generate specified health status colonies (SPF and gnotobiotics)
- x) Understand how disease-free (health status) certificates work and the principles of disease free (health status) certificates
- y) Manage breeding colony health monitoring programmes, including sentinel management
- z) Quarantine and introduction of new animals
- aa) Perform specific reproductive procedures for example C-section and embryo transfer (if experience not possible, must demonstrate an understanding of these procedures)
- bb) Ensure all records and cage labelling are up to date and correct on a daily basis
- cc) Record and be able to analyse all breeding data

15. Prepare environment for laboratory animal procedures including theatre management

- a) Ensure structural requirements are adequate (airflow, temperature, etc.)
- b) Ensure environment is prepared to correct state of cleanliness, disinfection, sterilisation (depending on procedure)
- c) Ensure all surgical instruments are correctly prepared
- d) Prepare equipment and materials for the procedure
- e) Ensure aseptic techniques are followed at all times
- f) Ensure the principles of avoiding infection are followed (HALSTED principles)
- g) Ensure correct personal hygiene and personal protective equipment
- h) Assist others to prepare for procedures (such as gowning, PPE)
- i) Manage waste, ensuring that all waste / spillage is disposed of correctly
- j) Sanitise equipment and material after use
- k) Return equipment and material to the correct location
- l) Restore the environment to its original state of cleanliness following the procedure

- m) Restock consumables
- n) Ensure all data is recorded immediately
- o) Report any incidents immediately and to the correct person

16. Knowledge of legal, ethical, welfare and professional requirements

- a) Demonstrate an understanding of legislation as it pertains to the field of LAT: The Veterinary and Para-Veterinary Act (Act 19 of 1982), Animals Protection Act (Act 71 of 1962), Genetically Modified Organisms (GMO) Act (Act 15 of 1997), Animal Diseases Act (Act 35 of 1984), Animal Improvement Act (Act 62 of 1998), National Environmental Management: Biodiversity Act (Act 10 of 2004), Medicines and Related Substances Act (Act 101 of 1965)
- b) Demonstrate practical application of the National Standards (SANS 10386).
- c) Demonstrate practical application of the 3Rs
- d) Demonstrate practical application of the 5 freedoms
- e) Demonstrate an understanding of the view of animal research in society (positive and negative)
- f) Demonstrate an understanding of the difference between animal rights and animal welfare
- g) Demonstrate an understanding of sentience
- h) Recognise pain and distress in laboratory animals
- i) Demonstrate an understanding of the principles of harm and be able to undertake a benefit assessment
- j) Demonstrate practical application of the principles of humane euthanasia
- k) Be able to advise personnel on the selection of appropriate animal care and use procedures and techniques, in line with ethical standards and legal requirements.
- l) Demonstrate an understanding of human welfare such as compassion fatigue, the cost of caring, the concept of a culture of care

17. Prepare laboratory animals for procedures

- a) Ensure the correct animal is selected for the procedure
- b) Restrain the animal safely and with care
- c) Prepare the animal for behavioural studies, non-invasive procedures, aseptic procedures and surgery
- d) Withhold food and water as required and record time

18. Perform clinical procedures on laboratory animals

- a) Procedures should be competently performed on the animal species listed in Table 1.
- b) Handling of scheduled medicines under the control of a veterinarian
- c) Advise the most appropriate procedures and techniques based on the principles of the 3Rs, i.e. Refinement, Reduction and Replacement of animal use.
- d) Care for animals appropriately during, and after, procedures has been performed.
- e) Maintain patient homeostasis
- f) Perform the procedures listed in Table 1, under an appropriate level of supervision.

19. Research / project management

- a) Demonstrate a practical understanding and application of research methodology
- b) Be able to set up an animal research project in accordance with the Animal Ethics Committee (AEC) protocol
- c) Demonstrate the physical preparation of physical areas (e.g. theatre)
- d) Perform the relevant administration / sampling processes
- e) Order the correct animals as per protocols and allocate to experimental studies
- f) Be able to draw up an experimental timeline (schedule from AEC protocol)
- g) Demonstrate an understanding of the importance of sample size
- h) Demonstrate an understanding of factors that can influence (confound) experimental results
- i) Demonstrate the standardisation of experimental conditions
- j) Demonstrate a practical understanding of the impact of nutrition and water quality on research
- k) Monitor animal welfare and implement humane endpoints
- l) Adhere to the AEC protocol
- m) Report any incidents that deviate from the protocol or impact on animal welfare to the correct person
- n) Liaise with AEC, relevant welfare organisations, researchers / students
- o) Ensure correct waste disposal and decontamination
- p) Maintain records according to correct quality management principles
- q) Understand relevant basic statistics

20. Quality Management Systems

- a) Demonstrate practical application of quality management
- b) Demonstrate the ability to work within a quality assurance unit
- c) Demonstrate an understanding of the local animal ethics committee
- d) Generate unit specific Standard Operating Procedures (SOPs)
- e) Validate SOPs
- f) Train in SOP procedures
- g) Assess and confirm competence in SOPs
- h) Maintain up to date and accurate records of competence
- i) Demonstrate an understanding of the impact of the South African National Standards (SANS 10386) for the care and use of animals in research
- j) Demonstrate an understanding of the Organisation for Economic Development (OEDC), which controls standards such as Good Laboratory Practice (GLP)
- k) Demonstrate an understanding of the impact of the South African National Accreditation System (SANAS), South African Veterinary Council (SAVC), National Council of SPCs (NSPCA), South African Health Products Regulatory Authority (SAHPRA), National Health Research Ethics Council (NHREC), Department of Health (DEH)
- l) Control all documentation according to the requirements of "controlled documentation"

- m) Controlled documentation as defined by GLP relates to anything pertaining to a study (e.g. animal room temperatures, training records, study deviations and so on)
- n) Adhere to good data capturing practice
- o) Ensure validation of systems and equipment
- p) Adhere to municipal requirements e.g. sample disposal, waste and water management

21. Facility Management

- a) Measure environmental parameters: temperature, relative humidity, ambient light intensity, light cycles, noise pollution including ultra sound, vibration, directional airflow, air quality
- b) Demonstrate an understanding of environmental parameters on animal health, safety and research
- c) Demonstrate an understanding of HVAC
- d) Maintain different types of filters for barrier or isolator conditions
- e) Monitor and manage work flow and the separation of clean and dirty functions
- f) Manage the operation, maintenance and servicing of basic laboratory equipment including calibration. of: scales, water purification systems, caging systems, autoclaves, biosafety cabinets, laminar flow hoods, fume cupboards
- g) Maintain accurate and up to date records of all equipment
- h) Demonstrate working in different bio-safety environments, including bio-containment areas, bio-exclusion areas and different bio-safety levels
- i) Maintain barrier unit management including hygiene practices
- j) Demonstrate health and safety practices and an understanding of common occupational hazards
- k) Create disaster management plan
- l) Implement disaster management plan
- m) Manage occupational health programmes e.g. staff vaccinations and compulsory health monitoring programmes
- n) Manage stock of all consumables
- o) Manage waste handling and disposal
- p) Manage pest control policies
- q) Manage the correct storage of food and bedding
- r) Manage the correct sterilization of food and bedding
- s) Manage access control and security including evacuation
- t) Manage emergency plan and fire prevention
- u) Manage the handling and storage of experimental and therapeutic drugs
- v) Manage schedule drug control under the supervision of a veterinarian

22. People and professional skills

- a) Perform supervision of staff
- b) Demonstrate professional communication / interaction
- c) Perform basic financial management e.g. budgets, business practice
- d) Demonstrate awareness of cultural differences and disability
- e) Demonstrate an application of employment conditions according to the Basic Conditions of Employment Act (Act 75 of 1997)
- f) Ensure employee readiness
- g) Practice the principles of good time management
- h) Manage agreements (e.g. confidentiality agreements)

- i) Maintain professional interaction with veterinary and other para-veterinary professions
- j) Demonstrate application of conflict management
- k) Demonstrate how to conduct an employee staff appraisal

LABORATORY ANIMAL TECHNOLOGIST - BASIC PROCEDURES TO FOLLOW BEFORE STARTING, REGISTERING AND RUNNING OWN BUSINESSES

23. Business skills and competency

Basic soft business skills

- a) 23.2 Communication- develop skills to communicate effectively with clients and other stake holders.
- b) 23.3 Ability to be a leader and provide direction on activities of the business
- c) 23.4 Ability to examine, analyse and present information accurately.
- d) 23.5 Ability to organise activities and time management to maximise revenue generation.
- e) 23.6 Ability to identify problem areas and devise solutions to problems.

Innovation

Critical thinking- ability skills.

24. Technical business skills

- a) Basic Business Planning.
- b) Be able to draw up and implement business plans based on business goals and how to access credit from financial institutions.
- c) Entrepreneurial skills, ability to do research and identify where business will operate.
- d) Managing and monitoring business activities (business administration, human resources, finance, marketing and sales, logistics and warehousing, facilities and infrastructure and IT systems to maximise efficiency of performance).

25. Organise and coordinate work/workflow (determining areas of responsibility and allocation)

- a) Ability to plan and implement a marketing strategy
- b) Management & maintenance of facilities, equipment & vehicles
- c) Management of supplies, veterinary products, cold chain,
- d) Identify suppliers, other veterinary / para-veterinary service providers to collaborate with for referrals and mentoring
- e) Ability to understand and implement risk management strategies
- f) Financial management – be able to keep business and personal finances separately
- g) How to create cost- estimates for clients.

26. Implement receipting and invoicing systems

- a) Cash flow forecast, sales and management of expenses

- b) Basic financial budgeting and financial reporting.
- c) Ability to understand, Interpret and apply the various legislation, rules and policies affecting the practice and business environment

27. Ensuring that the business complies with various instruments applicable in the specific sector

NOTE: the definition of competency is based on the South African Qualifications Authority (SAQA) definition, which is threefold and comprises:

- Practical competency (skills*)
- Foundational competency (knowledge)
- Reflexive competency (adaptability)

***SKILLS:** Developed through an appropriate training course or degree program (such as the Institute of Animal Technology (IAT) IAT Level 3 Diploma in Laboratory Animal Science and Technology) in combination with the Work-Integrated Learning Programme approved by the South African Veterinary Council (SAVC).

Table 1: List of procedures per animal species that are regarded as Day 1 Skills

Note: The procedures per species highlighted in this table indicates the ideal competence situation, however it is understood that a given person would not necessarily be competent in each procedure in all indicated species. The overall assessment of competence is based on the relative scoring importance awarded to each procedure-species combination, as implemented in the Work Integrated Learning logbook system employed during the training of Laboratory Animal Technologists.

Procedure	COMPULSORY SPECIES					SELECT ONE LARGE ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Ham ster	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
Blood collection (terminal cardiac puncture)	X	X	X		X								
Blood collection (tail vein)	X	X											
Blood collection (artery)			X										
Blood collection (venous)	X	X	X		X	X	X	X	X	X	X	X	
Blood pressure monitoring (Non-invasive)		X				X	X	X	X				
Calliper measurement (cutaneous lesions)	X	X	X	X	X	X	X	X	X	X	X	X	X

Procedure	COMPULSORY SPECIES					SELECT ONE OTHER ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Fish	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
Catheterisation (extremity)		X	X			X	X	X	X	X	X		
Catheterisation (tail)	X	X											
Clinical examination (general)	X	X	X	X	X	X	X	X	X	X	X	X	X
Clipping (tail-cuts)	X	X		(fin clipping)									
Clipping (teeth)	X	X	X			X							
Clipping (nails)	X	X	X		X		X	X	X			X	
Clipping (beaks)												X	
Embryonated egg inoculation, candling and sampling												X	
Euthanasia (cervical dislocation)	X	X										X	
Euthanasia (decapitation)	X	X		X								X	X
Euthanasia (destruction of the brain by pithing or captive bolt)										X			X
Euthanasia (inhaled, volatile anaesthetic with or without CO2)	X	X										X	

Procedure	COMPULSORY SPECIES					SELECT ONE OTHER ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Fish	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
Euthanasia (injectable)	X	X	X	X	X	X	X	X	X	X		X	X
Euthanasia (immersion) (snap freeze)				X									
Euthanasia – confirmation of death	X	X	X	X	X	X	X	X	X	X	X	X	X
Fluid infusion	X	X	X		X	X	X	X	X	X	X		
General anaesthesia (inhalant (describe))	X	X	X		X	X	X	X	X			X	X
General anaesthesia (intravenous)	X	X	X	X	X	X	X	X	X			X	X
General anaesthesia (extra vascular)	X	X	X				X						
General anaesthesia (immersion)				X									
General anaesthesia (monitoring before, during & after procedure)	X	X	X	X	X	X	X	X	X			X	X
Identification (ear tags or patagial tags)	X	X	X		X	X				X		X	
Identification (ear notching)	X	X			X	X							

Procedure	COMPULSORY SPECIES					SELECT ONE OTHER ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Fish	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
Identification (micro-chipping)	X	X	X	X	X	X	X	X	X	X	X	X	X
Injection (intra-muscular)	X	X	X	X	X	X	X	X	X	X	X	X	X
Injection (intra-peritoneal)	X	X	X	X	X							X	X
Injection (intra-venous)	X	X	X		X	X	X	X	X	X	X	X	
Injection (sub-cutaneous)	X	X	X	X	X	X	X	X	X	X	X	X	X
Administration of substances by oral gavage	X	X	X		X	X	X	X	X	X	X		
Administration of substances by immersion				X									
Intubation (endo-tracheal)			X			X	X	X	X				
Mechanical respiration (positive pressure ventilator)			X			X	X	X	X				
Physical handling	X	X	X	X	X	X	X	X	X	X	X	X	X
Physical restraint	X	X	X	X	X	X	X	X	X	X	X	X	X
Preparation of samples for culture	X	X	X	X	X	X	X	X	X	X	X	X	X

Procedure	COMPULSORY SPECIES					SELECT ONE OTHER ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Fish	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
<i>or pathology (preparation does not mean running the test) (blood, body fluids, saliva, ascites, free flow urine, faeces)</i>													
Preparation of cytological smears (blood, vaginal smear)	X	X	X	X	X	X	X	X	X	X	X	X	X
Substance administration (cutaneous/topical)	X	X	X	X	X	X	X	X	X	X	X	X	X
Substance administration (oral gavage)	X	X	X							X		X	
Surgical procedures (lancing of abscesses)	X	X	X	X	X	X	X	X	X	X	X	X	X
Surgical procedures (suturing of superficial wounds)	X	X	X	X	X	X	X	X	X	X	X	X	X
Surgical assistance	X	X	X	X	X	X	X	X	X	X	X	X	X
Surgical preparation (patient)	X	X	X	X	X	X	X	X	X	X	X	X	X

Procedure	COMPULSORY SPECIES					SELECT ONE OTHER ANIMAL SPECIES							
	Mouse	Rat	Rabbit	Fish	Guinea pig	Pig	Primate	Dog	Cat	Sheep	Goat	Chicken	Frog
Surgical preparation (operative area)	X	X	X	X	X	X	X	X	X	X	X	X	X
Surgical preparation (surgeon)	X	X	X	X	X	X	X	X	X	X	X	X	X
Swab collection for diagnostic purposes	X	X	X	X	X	X	X	X	X	X	X	X	X
Tissue/organ collection (post-mortem)	X	X	X	X	X	X	X	X	X	X	X	X	X
Perform basic post-mortem examination	X	X	X	X	X	X	X	X	X	X	X	X	X
Using tranquilliser dart gun and blow pipe within the vivarium							X						
Weighing (including correct management of scale)	X	X	X	X	X	X	X	X	X	X	X	X	X
Wellbeing monitoring (daily health and welfare)	X	X	X	X	X	X	X	X	X	X	X	X	X

[16 – 17 November 2023 and Electronic Decision Council C/2023/0016 (28 Nov 2023)]
[VC/EDUC/DAY 1 SKILLS_LAT]