



Australian Government

MSL914001 Prepare practical science classes and demonstrations

Release: 1

MSL914001 Prepare practical science classes and demonstrations

Modification History

Release 1. Supersedes and is equivalent to MSL914001A Prepare practical science classes and demonstrations

Application

This unit of competency covers the ability to manage the day-to-day running of science teaching laboratories and the preparation of practical experiments, demonstrations and field trips.

This unit of competency is applicable to technical assistants and technical officers working in the secondary and tertiary education sectors. It also applies to zoos, aquariums and museums that run education programs. Personnel are required to assess and treat risks associated with practical activities. Some personnel may have the additional role of fire warden, first aid officer or work health and safety (WHS) representative. They may also have other skills, such as maritime, SCUBA diving or trade qualifications. They may work autonomously but are required to liaise closely with teaching staff about the design and scheduling of practical activities.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Communication/organisation

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Ensure safe work practices	1.1	Organise and perform risk assessments to identify hazards and analyse risks associated with planned practical activities
		1.2	Select and implement appropriate controls for identified risks and monitor their effectiveness

- | | | | |
|---|--|-----|--|
| | | 1.3 | Ensure preparation and conduct of practical activities are performed in accordance with relevant regulations, codes, guidelines and workplace procedures |
| | | 1.4 | Select, fit and use personal protective equipment (PPE) and ensure that it is used by students and teachers |
| | | 1.5 | Ensure materials and equipment are handled, prepared, stored and disposed of safely |
| | | 1.6 | Address incidents and emergencies as they arise |
| 2 | Plan work schedule | 2.1 | Plan schedule of classes and demonstrations in consultation with teaching staff to ensure timely delivery |
| | | 2.2 | Communicate effectively with staff and students using appropriate negotiation and conflict resolution skills |
| | | 2.3 | Prioritise work activities and manage time to meet deadlines |
| | | 2.4 | Modify work plan to deal with contingencies as they arise |
| 3 | Organise experiments and demonstrations | 3.1 | Collect materials and equipment from appropriate sources |
| | | 3.2 | Perform pre-use checks, prepare material and equipment and organise ready for use |
| | | 3.3 | Demonstrate practical skills, techniques and use of materials and equipment, as required |
| | | 3.4 | Organise clean-up operations and recycling or disposal of waste |
| | | 3.5 | Trial experiments and demonstrations and recommend variations or alternatives |
| 4 | Manage resources | 4.1 | Operate practical activities within approved budgets |
| | | 4.2 | Maintain and control stocks of materials and equipment |
| | | 4.3 | Maintain storerooms, preparation areas and laboratories |

fit for purpose

- 4.4 Evaluate and select materials and equipment and make recommendations for purchase
- 4.5 Order, receive and store materials and equipment using workplace procedures
- 4.6 Organise quotes and bookings for transport and accommodation for field trips, as necessary
- 4.7 Service and/or repair laboratory equipment where feasible
- 4.8 Arrange for the servicing or repair of equipment by appropriate personnel or accredited service agents, as necessary

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards, guidelines and codes covering safety in laboratories; occupational protective equipment; labelling of workplace substances; storage, handling and transport of dangerous goods; environmental management; physical containment levels and facility types
- national WHS standards, animal welfare legislation and codes of practice, and permits for wildlife capture and handling
- gene technology regulations
- principles of good laboratory practice (GLP)

Hazards

Hazards associated with practical science classes and demonstrations include, but are not limited to, one or more of:

- electric shock
- microbiological organisms and agents associated with soil, air, water, blood and blood products, and human or animal tissue and fluids
- solar radiation, dust and noise, and exposure to extreme weather conditions
- snake, insect and animal bites
- chemicals, such as acids, heavy metals, pesticides and hydrocarbons
- radiation, such as alpha, beta, gamma and X-ray
- aerosols from broken centrifuge tubes and pipetting
- sharps, broken glassware and hand tools
- cryogenics, such as dry ice and liquid nitrogen
- fluids under pressure, such as steam, hydrogen in gas liquid chromatography and acetylene in atomic absorption spectrometry
- sources of ignition, high temperature processes and flammable liquids
- disturbance or interruption of services
- occupational overuse syndrome
- slips, trips and falls, manual handling, working at heights and working in confined spaces, crushing, entanglement and cuts associated with moving machinery or falling objects
- vehicle and boat handling

Risk control measures

Risk control measures include, but are not limited to, one or more of:

- ensuring access to service shut-off points
- recognising and observing hazard warnings and safety signs
- labelling of samples, reagents, aliquoted samples and hazardous materials
- using PPE, such as hats, hearing protection, gloves, safety glasses, coveralls, gowns, body suits, respirators and safety boots
- handling and storing hazardous materials and equipment in accordance with labelling, material safety data sheets (MSDS) and manufacturer's instructions
- applying containment procedures through the use of appropriate equipment, such as biohazard containers, laminar flow cabinets, Class I, II and III biohazard cabinets, and Class PCII and PCIII physical containment facilities

- cleaning and decontaminating equipment and work areas regularly using workplace procedures
- following established manual handling procedures
- identifying and reporting operating problems or equipment malfunctions
- reporting abnormal emissions, discharges and airborne contaminants, such as noise, light, solids, liquids, water/wastewater, gases, smoke, vapour, fumes, odour and particulates to appropriate personnel

Risk assessment

Risk assessment includes:

- identifying and analysing the risk, and considering potential consequences in terms of exposure and hazard and likelihood of each
- assessing the effectiveness of existing controls
- determining level of risk, comparing with pre-established criteria for tolerance (or as low as reasonably achievable) and ranking of risks requiring control

Typical materials

Typical materials include, but are not limited to, one or more of:

- live flora and fauna, such as plant specimens
- animals, such as rats, bacteria, algae, insects and fungi
- blood and blood products, human or animal tissue and fluids
- distilled water, reagents, chemicals, disinfectants, detergents, agar media and plates
- consumable items, such as syringes, pipette tips and weigh boats
- oils/lubricants, fuels, industrial gases and cryogenics, such as dry ice and liquid nitrogen
- equipment spares, such as fuses, bulbs and batteries
- teaching aids, such as textbooks and videos
- reference samples and standards

Typical equipment

Typical equipment includes, but is not limited to, one or more of:

- analytical instruments, such as ultraviolet-visible (UV-VIS) and atomic absorption spectrometers (AAS), gas chromatography (GC) and high pressure liquid chromatography (HPLC)
- containment equipment, such as fume hoods, biohazard containers and biological safety cabinets, and animal cages
- general equipment, such as autoclaves, ultrasonic cleaners, dishwashers, refrigerators, freezers, ovens, microwave ovens, incubators, gas cylinders and muffle furnaces

- specialised equipment, such as microtomes and tissue processors, cell counters and staining machines, light and fluorescence microscopes, pH meters and ion selective electrodes
- bench equipment, such as thermometers, balances, blenders, centrifuges and separating equipment, water baths, hotplates, mantles, burners, glassware (burettes, pipettes), plastic ware, glass, plastic and quartz cuvettes
- teaching aids, such as technology players and computers

Incidents and emergencies

Incidents and emergencies include one or more of:

- workplace injury and accidents
- biological and chemical spills
- leakage of radioactivity
- fire, bomb and security threats

Contingencies

Contingencies include one or more of:

- new information
- urgent requests
- modified activities
- changed situations
- late instructions
- substitution of materials or equipment

Sources of materials and equipment

Sources of materials and equipment include one or more of:

- land and sea-based field trips
- botanic gardens and parks
- abattoirs
- commercial suppliers
- blood banks

Resource management

Resource management includes one or more of:

- preparation of operational plans, schedules and budgets
- handling of petty cash and reconciliation of bank statements, and use of a workplace credit card
- contacting suppliers and completing order requisition forms

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health, where relevant

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSL914001A Prepare practical science classes and demonstrations

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL914001 Prepare practical science classes and demonstrations

Modification History

Release 1. Supersedes and is equivalent to MSL914001A Prepare practical science classes and demonstrations

Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- managing the day-to-day running of science teaching laboratories and preparing practical experiments, demonstrations and field trips
- working with teaching staff and students to assess risks, develop and implement controls and monitor their effectiveness
- working with teaching staff and students to ensure all practical activities are performed safely (through demonstrations and monitoring of practical activities)
- developing operational plans, work schedules, job cards and budgets
- clarifying and designing practical activities and assessing resource needs
- preparing laboratory experiments and demonstrations on time with the correct materials and equipment
- managing contingencies and resources within level of responsibility
- maintaining the laboratory fit for purpose
- obtaining stocks of materials and equipment using workplace procedures
- organising quotes and bookings using workplace procedures
- working effectively with students and staff who may have diverse work styles, cultures and perspectives.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- principles of risk assessment, risk management and hierarchy of control
- principles of small scale budgeting, operational planning and efficient resource use
- scientific terminology and technical details of sampling, testing, equipment and instrumentation used in the education program's practical activities
- relevant legislation, regulations and codes governing practical activities
- workplace procedures for the purchase, handling, storage and transport of materials and equipment
- relevant work health and safety (WHS) and environment requirements.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL944001 Maintain laboratory or field workplace safety
 - relevant MSL974000 series of units of competency
 - relevant MSL975000 series of units of competency
- Holistic assessment methods include:
 - review of operational plans, schedules and budgets prepared by the candidate
 - review of risk assessments and control strategies prepared by the candidate
 - review of job cards detailing completed tasks by the candidate
 - feedback from students, teaching staff, suppliers and supervisor
 - observation of the candidate assisting teaching staff and students during practical activities
 - written or oral questions to assess the candidate's knowledge of relevant workplace procedures, technical details of practical activities and his/her ability to handle a range of contingencies.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - laboratory/field work environment, equipment and materials
 - personal protective equipment (PPE) and safety equipment
 - WHS management system, policies and procedures.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competency and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:

- performing the competency being assessed as part of current employment OR
- having consulted with a laboratory about performing the competency being assessed within the last twelve months.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>