

# Maintenance and Operation of a Safe Laboratory



## Activity scope

This document relates to student participation in Maintenance and Operation of a Safe Laboratory as a curriculum activity.

## Special considerations

A laboratory for the purposes of this document refers to a specialist area set aside for the preparation and operation of scientific experimental procedures associated with learning.

Other areas, including science demonstration rooms, primary school activity areas, science trolleys and sites used for field excursions and industry visits that may be the site for science learning activities are covered in *Maintenance and Operation of a Safe Work Area Outside the Laboratory*.



## Minimum activity-specific qualifications for supervisors

### *For Low risk activities*

- Knowledge of the activity and its potential hazards.

### *For Medium and High risk activities*

- Experience (previous involvement) in the activity.

## Minimum activity-specific equipment/facilities

- Label all chemicals appropriately.
- Note that for each chemical stored, a copy of the appropriate material data safety sheet must be readily accessible to all applicable personnel and the relevant information noted.
- Ensure that the site for the storage of all chemicals is in accordance with criteria given in [Chemical Hazards](#).
- Protective equipment appropriate for the particular activity, i.e. safety glasses, gloves and laboratory coats or aprons.
- If live animals involved, a site for maintaining them in accordance with criteria given in [Animal Use in Queensland State Schools](#) and *Handling Live Animals in a School Setting*.
- Ensure that practical areas have:
  - suitable ventilation for the activity,
  - adequate room for the movement of persons involved so they do not cause additional hazards,
  - access to all applicable safety equipment.
- Ensure that a fume cupboard is used where inhalation of a reactant or product of the activity is a hazard.

## Activity-specific hazards/risks and suggested control measures

- Where it is judged that the educational benefit of the activity requires the students to use hazardous chemicals, establish management processes for the handling, distribution, use and disposal of the chemicals. In general, the smallest quantity to guarantee the viability of the experiment should be used.
- Ensure [Electrical Safety Guidelines](#) are adhered to.
- Ensure that the location enables sufficient supervision to be maintained at all times.
- Ensure that appropriate and accessible exits for emergency evacuations are present, and that all persons engaged in the activity are aware of the emergency evacuation procedures.
- Make first aid equipment and consumable items appropriate to the activity readily available.
- Ensure hazardous substances guidelines are adhered to.
- Ensure that the purchasing policy does not permit excessive stocks of chemicals to be established.



- Take the age of chemicals into account when assessing the risk associated with these chemicals.
- Establish safe procedures for the preparation and use of stock solutions.
- Implement control processes to restrict the possibility of spillage and accidental contact with chemicals, and allow the safe containment and/or easy removal of spilled chemicals. Such processes may include:
  - limiting the amounts of chemicals used
  - restricting movement around benches
  - replacing the lids on containers immediately after use
  - using sand baths and trays
  - having access to running water.
- Identify, before the activity starts, processes for the cleaning and disposal of spills for the particular substances used. Inform students of the appropriate method of dealing with those substances if they are spilled.
- Dispose of unwanted and waste chemicals appropriately.
- Implement control processes for the safe use of heat and/or the use of combustible substances. Such processes may include:
  - keeping burners on low heat while not directly in use
  - using small quantities of combustible substances
  - keeping combustible substances a specified distance away from naked flames
  - using appropriate water-bath techniques.
- Implement control processes to restrict the possibility of personal contact with any chemical. Such processes may include:
  - appropriate labelling
  - using small quantities
  - using equipment appropriately and rinsing after use.
- Ensure high risk equipment is appropriately labelled.
- Hazards associated with biological materials and animals should be identified and appropriate management routines established. Treat all biological material as though it is contaminated.

### Useful activity-specific links

- Animal Use in Queensland State Schools  
<http://ppr.det.qld.gov.au/education/management/Pages/Animal-Use-in-Queensland-State-Schools.aspx>
- *Biological Activities – Science* — Curriculum Activity Risk Assessment Guidelines
- Chemical Hazards  
<http://education.qld.gov.au/schools/healthy/docs/chemhazards.doc>
- Chemical Hazards Guidance notes  
<http://education.qld.gov.au/schools/healthy/docs/guidance-notes.doc>
- Electrical safety guidelines  
<http://education.qld.gov.au/health/pdfs/healthsafety/es-quick-ref-guide-part-2.pdf>
- *Handling of Live Animals in a School Setting* — Curriculum Activity Risk Assessment Guidelines
- *Maintenance and Operation of a Safe Work Area Outside the Laboratory* — Curriculum Activity Risk Assessment Guidelines
- *Safe Operation of Laboratory Equipment* — Curriculum Activity Risk Assessment Guidelines
- *Science Experiment Activities, Conducting Safe Work Practices* — Curriculum Activity Risk Assessment Guidelines
- Science Teachers' Association of Queensland  
<http://www.staq.qld.edu.au/>