

Safe Operation of Laboratory Equipment



Activity scope

This document relates to the safe use of laboratory equipment during a curriculum activity. Laboratory equipment used for school activities might include:

- glassware used for heating and/or mixing substances
- instruments for measuring mass, volume, size, temperature or other physical and/or chemical parameters
- electrical equipment that might be involved in heating/cooling or used to produce motion via motors, belts, cogs and other mechanically mobile components
- special dedicated-purpose apparatus that might be relocatable or might be part of a permanent fixture or facility.



Laboratory equipment may be used within specialised science facilities such as school laboratories or agricultural sections, or in general classrooms, playgrounds or on school excursions. Refer to the related Science risk assessment guidelines for details: [Biological Activities](#), [Chemical Hazards in the Curriculum](#) and related [Chemical Hazards Guidance Notes](#), [Maintenance and Operation of a Safe Laboratory](#), [Maintenance and Operation of a Safe Work Area Outside the Laboratory](#), and [Science Experiment Activities, Conducting Safe Work Practices](#).

Special considerations

Only lasers of Class One continuous, Class Two continuous and Class Three A are to be used in schools. Laser pointers are to be Class One or Two only (refer to the [Safety Guide for the Use of Radiation in Schools](#)).

Minimum activity-specific qualifications for supervisors

Low risk level (operation of low-voltage electrical equipment, microscopes, telescopes, magnetic equipment, simple machines, data loggers and probes, and static electricity equipment):

- An adult with knowledge of the activity and its potential hazards.

Medium risk level (equipment operating under some pressure or vacuum, fragile equipment, equipment producing low levels of radiation, producing gases or fine particulates, some high-voltage electrical equipment, Class One lasers, and equipment generating heat or cold):

- An adult with experience (i.e. previous involvement) in the activity.

High risk level (operation of high-voltage, high current [typically greater than 20 milliamps] electrical equipment, radiation-emitting sources, lasers [Class Two and Three], equipment generating very high or very low temperatures, equipment using very high or very low pressure):

- An adult with competence (i.e. demonstrated ability) in the activity.

Minimum activity-specific equipment/facilities

- Protective equipment appropriate for the particular activity, such as safety glasses and laboratory coats or aprons.
- Access to a fume cupboard, if relevant, where inhalation of some reactant or product of activity is a hazard.

Activity-specific hazards/risks and suggested control measures

- Ensure [Electrical Safety Guidelines](#) are adhered to.
- Implement control processes for the safe use of heat and/or the use of combustible substances in any activity. Such processes might include:
 - keeping burners on low heat while not directly using them
 - using very small quantities of combustible substances
 - keeping combustible substances a specified minimum distance away from naked flames



- using appropriate water-bath techniques
- ensuring loose clothing and long hair is appropriately secured.
- Ensure that any electrical equipment not connected to a certified safety switch has a current test certification. All participants should be aware of the location of the electrical isolation switch. Electrical leads should not pass from bench to bench, suspended in the air. Where leads are across floors, they must be secured (e.g. taped down) and covered for protection.
- Note that with high-risk equipment, it is likely that teacher demonstration will feature as a principal mode of operation. Placement of students should be given serious consideration.
- Ensure that all persons are aware of the kinds of equipment that may produce radiation. Learners should be placed at least a minimum distance away from such apparatus.
- Note that equipment which needs or produces heat should be insulated or placed so that accidental access to it is restricted.
- Ensure that operators of equipment (whether students or staff) are given sufficient instruction in the safe operation of the equipment.

Useful activity-specific links

- *Biological Activities* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/pdf/biological-activities.pdf>
- *Chemical Hazards in the Curriculum* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/doc/chemical-hazards-template.doc>
- *Chemical Hazards Guidance Notes*
<http://education.qld.gov.au/curriculum/carmg/doc/guidance-notes.doc>
- Electrical Safety guidelines
<http://education.qld.gov.au/health/pdfs/healthsafety/electrical-safety-guide.pdf>
- *Handling of Live Animals in a School Setting* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/pdf/handling-live-animals.pdf>
- *Maintenance and Operation of a Safe Laboratory* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/pdf/maintenance-operation-safe-laboratory.pdf>
- *Maintenance and Operation of a Safe Work Area Outside the Laboratory* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/pdf/maintenance-operation-outside-lab.pdf>
- Safety Guide for the Use of Radiation in Schools
<http://www.arpansa.gov.au/publications/codes/rps18.cfm>
- *Science Experiment Activities, Conducting Safe Work Practices* – Curriculum Activity Risk Assessment guideline
<http://education.qld.gov.au/curriculum/carmg/pdf/science-experiment-activities.pdf>

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