Legal obligations to carry out risk assessments of science experiments in schools in Western Australia

The Work Health and Safety Act 2020, its Regulations and Codes of Practice require schools to identify, assess and control risks of school science experiments, the whole process generally being referred to as "risk assessment". We explain the legal situation regarding risk assessment and how the Codes of Practice should be interpreted by science staff doing experiments. The history of litigation following injuries in science experiments demonstrates that risk assessments should be documented and preserved in school records. Departments of Education in other States and Territories with almost identical legislation require their schools to carry out risk assessments and document them. The Australian Science Teachers Association, in its Science Assist advice, "recommends that a site-specific risk assessment be carried out for all science practicals".

Legal obligations to assess risks are included in the Work Health and Safety Act 2020 and the Work Health and Safety (General) Regulations 2022 of Western Australia. Advice on how to meet the obligations is provided in Codes of Practice on 'How to manage work health and safety risks' and 'Managing risks of hazardous chemicals in the workplace'. We review these documents, the interpretation of them in other States/Territories with similar legislation, and examine the advice of professional associations.

Work Health and Safety Act 2020

This Work Health and Safety Act 2020 of Western Australia is the highest legal instrument relating specifically to health and safety in the workplace. It applies to schools, as a place of work, for both staff and students.

According to the Work Health and Safety Act 2020, a duty is imposed on a person
(a) to eliminate risks to health and safety, so far as is reasonably practicable, and
(b) if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable ... taking into account and weighing up all relevant matters including (a) the likelihood of the hazard or the risk concerned occurring, and
(b) the degree of harm that might result from the hazard or the risk ...
[Part 2, Sections 17 and 18].

First of all, the good news: school staff only need to eliminate or minimise risks "*as far as is reasonably practicable"*. A court of law would decide what was 'reasonable" and this may vary with time as ideas and technologies change.

In order to eliminate or minimise "*risks to health and safety"*, it is implied that risks must first be identified. To determine whether an identified risk is significant, the risk must be assessed. If the risk is to be eliminated or minimised, something has to be done, that is, control measures have to be introduced. These processes are made explicit in the Work Health and Safety (General) Regulations 2022 (see next section).

The requirement for "*taking into account and weighing up all relevant matters*" is very broad. In the case of a school laboratory, the "*matters*" would include the facilities available (e.g.,

fume cupboard), the behaviour of the class (a huge factor!), students with allergies, students with special needs, etc.

The requirement to consider the "*likelihood of the hazard*" and the "*degree of harm that might result*" means that a full risk assessment is required, preferably using a risk matrix to estimate the risk level associated with each combination of likelihood and harm. Please see
https://www.riskassess.com.au/docs/G2_RiskAssessmentAndControlOfRisks.pdf
for an explanation of the risk assessment process and
https://www.riskassess.com.au/docs/RiskMatrix.pdf
for a summary of the different risk matrices used commonly in schools.
A textbook risk assessment or a risk assessment comprising a series of tick boxes does not satisfy the legislation.

The requirement for "*taking into account and weighing up all relevant matters*" implies that each class carrying out each experiment should be the subject of a separate risk assessment. The reason is that classes differ greatly in the facilities available, the behaviour of the students, students with allergies, students with special needs, etc. No one hat fits all! Fortunately, it is quite easy to carry out a separate risk assessment for each class doing each experiment using RiskAssess.

The Work Health and Safety Act 2020 is completely general, so it covers chemical, biological and physical hazards in science experiments.

Work Health and Safety (General) Regulations 2022

The Work Health and Safety (General) Regulations 2022 provides the machinery for the Act. It expands upon the requirements of the Act in particular areas and provides details of requirements for particular industries. A number of sections are relevant to school science laboratories:

A duty holder, in managing risks to health and safety, must identify reasonably foreseeable hazards that could give rise to risks to health and safety.
[Part 3.1, Section 34]

A hierarchy of control measures is to be implemented: substitution (wholly or partly) the hazard giving rise to the risk, isolation of the hazard, engineering controls, administrative controls and personal protective equipment [Part 3.2, Section 36]. This is a standard risk management procedure, described in detail in
https://www.riskassess.com.au/docs/G2_RiskAssessmentAndControlOfRisks.pdf

Control measures must be reviewed under many circumstances, including
(a) a change to the workplace itself or any aspect of the work environment; or
(b) a change to a system of work, a process or a procedure.
[Part 3.2, Section 38(3)]
This is another legal basis for the requirement to carry out a separate risk assessment for each class doing each experiment.

The Regulations cite Codes of Practice and Australia/New Zealand Standards.

Codes of Practice are admissible in court proceedings under the Work Health and Safety Act 2020 and Work Health and Safety (General) Regulations 2022. Courts may regard a code of practice as evidence of what is known about a hazard, risk, risk assessment or risk control and may rely on the Code in determining what is reasonably practicable in the circumstances to which the Code of Practice relates.

Codes of Practice are only a guide, whereas legislation is a requirement.

Codes of Practice in force in Western Australia are listed at
https://www.worksafe.wa.gov.au/work-health-and-safety-and-transitional-codes-practice
Two Codes of Practice are relevant to risk assessments in school science laboratories:
Codes of Practice: How to manage work health and safety risks, and
Code of Practice: Managing risks of hazardous chemicals in the workplace.
These are discussed below.

Code of Practice: How to manage work health and safety risks

The "Code of Practice: How to manage work health and safety risks" in Western Australia is general in nature and therefore has to cover simple to complicated cases:

Many hazards and their associated risks are well known and have well established and accepted control measures. In these situations, the second step to formally assess the risk is not required. If after identifying a hazard you already know the risk and how to control it effectively, you may simply implement the controls.

A risk assessment can be undertaken with varying degrees of detail depending on the type of hazard and the information, data and resources that you have available. It can be as simple as a discussion with your workers or involve specific risk analysis tools and techniques developed for specific risks or recommended by safety professionals. For some complex situations, expert or specialist advice may be useful when conducting a risk assessment.
[Section 3]

The Code of Practice allows a streamlined assessment of risks for simple situations when "*hazards and their associated risks are well known and have well established and accepted control measures*", the assessment being even "*as simple as a discussion with your workers*".
To decide whether a risk assessment needs to be carried out, further guidance is provided:

A risk assessment should be done when:
• there is uncertainty about how a hazard may result in injury or illness
• the work activity involves a number of different hazards and there is a lack of understanding about how the hazards may interact with each other to produce new or greater risks
• changes at the workplace occur that may impact on the effectiveness of control measures.
[Section 3.1]
We can consider each of the three situations in turn:

Based on the history of 'accidents' in school science experiments, it is apparent that some school staff have "*uncertainty about how a hazard may result in injury or illness*".

In a school science experiment, "*the work activity involves a number of different hazards*" without doubt, and "*hazards may interact with each other to produce new or greater risks*" (e.g., Bunsen burner under a tripod and gauze, with water boiling in a beaker). School staff, especially those new or not sufficiently trained, may have "*lack of understanding*".

"*Changes in the workplace*" would include different classes of students with different behaviours, allergies and special needs, which "*may impact on the effectiveness of control measures*".

On the basis of each of the three situations, a risk assessment should be done for all school science experiments.

Code of Practice: Managing risks of hazardous chemicals in the workplace

The 'Code of Practice: Managing risks of hazardous chemicals in the workplace' states

In many circumstances, a risk assessment will be the best way to determine the measures that should be implemented to control risks for hazardous chemicals in the workplace.
. . . .
Where the hazards and associated risks are well-known and have well established and accepted control measures, it may not be necessary to undertake a risk assessment, for example, where there are a small number of chemicals in a workplace and the hazards and risks are well understood. If after identifying a hazard you already know the risk and how to control it effectively, you may simply implement the controls.
. . . . .
Documenting risk assessments is not mandatory, but may help when reviewing where improvements can be made and risks controlled more effectively.
[Section 3]

For chemicals in a school laboratory, to what extent are "*the hazards and associated risks . . . well-known and have well established and accepted control measures*"? This is the question that needs to be answered to decide whether a risk assessment may not be necessary.

The example given of a situation where a risk assessment may not be necessary is "*where there are a small number of chemicals in a workplace and the hazards and risks are well understood*".

In school science experiments, "*more than a small number of chemicals*" is used, since
- a wide range of chemicals is often used in a single experiment
- many different experiments involve the use of chemicals during the year
- experiments may be modified to use different chemicals or concentrations
- new experiments may be undertaken.

The history of accidents in school laboratories demonstrates that, in some cases, risks are not "*well understood*". In addition, control measures depend critically on the behaviour of the class, students with allergies, special needs, etc.

It does not seem appropriate to exempt school experiments involving chemicals from the need to carry out risk assessments, since so many chemicals are used, in many different ways, and with control measures that depend critically on student factors that vary from class to class.

It would be up to a court of law to decide whether a risk assessment of an experiment involving the use of chemicals was required. This decision would almost certainly be made by a court after injuries had been sustained by one or more persons involved in a science experiment.

The 'Code of Practice: Managing risks of hazardous chemicals in the workplace' relates only to hazardous chemicals. Even in the unlikely event that it was considered unnecessary to carry out a risk assessment for chemical hazards, a risk assessment would still be required for biological hazards and for physical hazards.

Legislative interpretations throughout Australia

Government schools in Queensland, New South Wales, ACT, Victoria, Tasmania and South Australia are required to carry out risk assessments of science experiments in formats specified by the particular Department of Education. Catholic school systems and individual schools in these States also carry out risk assessments, as do many schools elsewhere in Australia. The jurisdictions of Queensland, New South Wales, ACT, Tasmania and South Australia all have legislation in place that is very similar to that in Western Australia. It is clearly the understanding in these jurisdictions that the legislation requires risk assessments of science experiments.

Common Law throughout Australia imposes a very high "duty of care" on those who are responsible for the safety of children. A court might decide that, in cases of uncertainty, a school should err on the side of caution by carrying out a risk assessment of an activity, even if it might be possible to argue that one was not necessary.

The Statute of Limitations imposes a 7-year limit on the commencement of legal proceedings in a court of law in response to an injury. However, the Statute is routinely waived by courts throughout Australia in cases where the Plaintiff could not have been aware of the injury during the 7-year period, e.g., cancers, such as mesothelioma, caused by asbestos fibres. In these cases, the Plaintiff has 7 years from the time at which the Plaintiff became aware of the injury in order to make a claim. Since injuries relating to chemicals in a laboratory may involve cancers with a long induction period, it is recommended that risk assessments be kept for the lifetime of the persons involved. It would then be possible, in the distant future, to demonstrate to a court that a risk assessment had been carried out, using the best available information at the time.

Professional advice

The Australian Science Teachers Association (ASTA), in its Science Assist advice https://asta.edu.au/wp-content/uploads/2025/03/Information-sheet_-Risk-assessment-final-docx.pdf
strongly recommends that a site-specific risk assessment be carried out for all science practicals. Some key sections in the advice are as follows:

When do you need to do a risk assessment?

. . . . . .

A risk assessment should be performed before the first time that you undertake a hazardous task or procedure to check that suitable controls are put into place to reduce the level of risk. It should take into consideration the site-specific details such as staff training, student behaviour (if applicable), the activity conducted and school facilities. It should be reviewed when there are any changes introduced, including new people undertaking the task, or when it has been five years since the last assessment.

Who does risk assessments?

Generally, the risk assessment for a practical activity in the laboratory/classroom environment would be conducted by the classroom teacher. They will need to assess the activity in view of their students' skills, abilities, behaviour, any medical conditions and the room facilities. The risk assessment for processes in the preparation room, generally would be conducted by the science technician. However, there may be times when a technician may have more knowledge of a chemical/process/technical skill than the teacher or vice versa. At these times a collaborative approach is most appropriate.

Recommendations

● *Science ASSIST recommends that a site-specific risk assessment be carried out for all science practicals to evaluate the activity being carried out so as to identify, assess and control any hazardous activities and/or processes. When assessing risks associated with a task, you need to consider any physical activities, the nature of the hazard itself, any equipment being used and who is involved. The person that has the best knowledge of the particular risks should carry out the risk assessment, generally, within a classroom, this is the classroom teacher, while in the preparation room, this would be the science technician. However, there may be times when a collaborative approach is more appropriate*

● *Science ASSIST considers that it is good practice to keep a copy of previous risk assessments, preferably attached or electronically linked to the activity involved. It serves as a record of your assessment, compliance with your Occupational or Workplace Health and Safety obligations, a reminder for the next time you perform this task as well as a guide for monitoring and reviewing control measures in preparing future risk assessments. The main aim is not to focus on the paperwork of the risk assessment process, but to ensure that suitable controls are put into place to reduce the level of risk.*

Conclusion

To comply with safety legislation in Western Australia, schools should carry out a separate risk assessment of each experiment being carried out by each class, taking into account "*all relevant matters*", including the facilities available, the behaviour of the class, students with allergies, students with special needs, etc.

Legislation does not specify the manner in which risk assessments should be carried out for school science experiments, except that a hierarchy of controls should be used. Science staff

should ensure that appropriate control measures are implemented to minimise the level of risk to students and staff.

To allow review of risk assessments and to provide a legal record, in case of litigation following an injury, each risk assessment should be documented and stored in the long-term records of the school.