ASSIST INFORMATION SHEET:

Risk management and risk assessment

'A safe and healthy workplace does not happen by chance or guesswork. It is everyone's responsibility to think about what could go wrong at the workplace and what the consequences could be. Then reasonably considered actions must be taken (in other words, whatever is 'reasonably practicable') to eliminate or minimise health and safety risks arising from any undertaking'. [1]

This process is known as 'risk management' and risk assessment is an important part of that process.

Risk management

It is a legal requirement under the Work Health and Safety legislation for every workplace to manage risks to health and safety so far as is reasonably practicable. Each workplace should implement a Risk Management policy to deal with these issues.

The aim of Risk Management is to minimise risks to ensure that no one is harmed and that there is no damage to property. It is a continuous process of identifying hazards, assessing risks and implementing the necessary control measures to reduce the level of risk. It involves effective communication and management of staff at all levels.

School science areas

Each school needs to establish its own risk management system that addresses reducing risks for workers as well as addressing the duty of care for students. Legislation does not specify the format that risk assessments should take and many discussions have been held regarding the requirements for risk assessments for activities conducted in science. School science areas deal with a diverse range of hazards such as physical, electrical, chemical, biological and other specialised hazards. Many activities are only conducted once a year possibly by different teachers and usually with different students, which increases the need for a risk assessment, as circumstances will be different. It is essential that the emphasis is on the thinking process involved in identifying the hazards, assessing the risks and then applying control measures to minimise the risks. The Science ASSIST Risk Assessment template is designed to help you in this process.

Science ASSIST recommends that a risk assessment is conducted and documented for all activities that involve a level of risk. This should take into consideration the site-specific details such as staff training, student behaviour, the activity conducted and school facilities.

The AS/NZS 2243.1 2005 *Safety in laboratories Part 1: 'Planning and operational aspects'* states:

> ***Section 3: Laboratory Safety and Emergency Management***
> ***3.1 LABORATORY SAFETY MANAGEMENT SYSTEMS***
> ***3.1.1 General***
> *'To manage occupational health and safety in a laboratory, laboratory safety systems shall be implemented. A laboratory safety system shall address the assessment and management of all risks and the provision of training, including hazard identification, for personnel. This system shall also address access to, and operations in, the laboratory pertaining to students, maintenance staff,*

contractors, visitors (including children), cleaners, security staff and animals (experimental and companion).'[2a]

Risk Assessment

A risk assessment is a systematic and recorded examination of the workplace and the activities conducted in it. A risk assessment is carried out to identify hazards, determine the likelihood of harm or damage occurring to people or property from these hazards and to determine control measures to eliminate or minimise the hazards.

The AS/NZS 2243.1 2005 *Safety in laboratories Part 1: 'Planning and operational aspects'* states:

> ***Section 3: Laboratory Safety and Emergency Management***
> ***3.1.2 Risk assessment***
> *'Risk assessments of all operations in the laboratory shall be carried out. Risk assessment can be described as a systematic use of the available information to identify hazards and to estimate the risks to staff, property or the environment and to take appropriate steps to avoid or mitigate identified consequences of those risks. For further information on risk identification, control and management see AS/NZS 4801.'*[2b]

A risk assessment generally involves a 4-step process:

1. **Identify the hazards**
2. **Assess the level of risk associated with the hazard**
3. **Implement control measures to address the risks**
4. **Monitor, review and document the effectiveness of the control measures**

1. IDENTIFY THE HAZARDS

Look for, identify and list all hazards associated with the activity/experiment/workplace.
A hazard is 'something that has the potential to cause harm to people, property or the environment.'[3] For example, laboratory glassware may not be normally considered hazardous, however if it is cracked, chipped or is broken it can have the potential to cause harm.

2. ASSESS THE LEVEL OF RISK ASSOCIATED WITH THE HAZARD

Assess the likelihood and potential consequences that the hazard(s) identified may cause harm to occur. "A 'risk' is the chance or probability of that hazard causing harm or damage to people, property or the environment."[3] For example, what are the chances of laboratory glassware being dropped and broken and what type of injury or damage could occur? A risk rating is a combination of the likelihood of something causing harm, and the severity of the harm it can cause. The level of risk increases as either the likelihood of harm or the severity of the harm increases.

A matrix such as this can be used to help rate risk levels:

	Consequences				
Likelihood	**Minor**	**First Aid**	**Major**	**Critical**	**Catastrophic**
Almost Certain	*Medium*	*High*	*High*	*Very High*	*Very High*
Likely	*Medium*	*Medium*	*High*	*High*	*Very High*
Possible	*Low*	*Medium*	*High*	*High*	*High*
Unlikely	*Low*	*Low*	*Medium*	*Medium*	*High*
Rare	*Low*	*Low*	*Medium*	*Medium*	*High*

This process is often named **CLR** – **C**onsequences – **L**ikelihood – **R**isk Rating.

3. IMPLEMENT CONTROL MEASURES TO ADDRESS THE RISKS

What action is required to reduce or eliminate the risk?

"A control is a mechanism or process that minimises the risk of the hazard becoming actual so protects people, property or the environment from the identified hazard."[3] A risk rating of high or very high would be considered significant and the activity should not be carried out without implementing effective control measures to reduce the risk to an acceptable level. The "hierarchy of risk controls" is often used in this process. It is a hierarchy because the steps are increasingly effective towards the top of the list. When it is not reasonably practicable to eliminate a hazard, then it is controlled by working through another or a number of control measures. For example, a science teacher may use plastic ware instead of glassware (substitution), give safety warnings (administrative), and require the use of eye protection for the activity (PPE).

This summarises the hierarchy of risk controls:

a. **ELIMINATION: Remove the hazard completely.** The risk is eliminated because the activity is not done. For example, a science teacher may decide not to use a particular chemical because it is too hazardous. This is the most effective control, but it is not always practicable.
b. **SUBSTITUTION: Is there a safer alternative?** Substituting a safer alternative reduces the risk. For example, a science teacher may decide to substitute with a less hazardous chemical. This is the second most effective control.
c. **ENGINEERING CONTROL: Change the work process, equipment or workplace to reduce the risk.** The risk is controlled through the use of a physical mechanism. Examples include the use of a fume cupboard to extract hazardous vapours or reducing the risk through creating a barrier or a distance between it and those present. This control depends on the effectiveness of the equipment or barrier used.
d. **ADMINISTRATIVE CONTROL: Implement guidelines/policies, use of signage, provide standard operating procedures, and offer training schemes to reduce the risk.** For example, a science teacher may warn students that a chemical is corrosive, and that they should avoid its contact with skin and eyes. Or the laboratory may have a sign to say that gloves must be worn when handling a particular material. This control works only if the advice is followed.
e. **PERSONAL PROTECTIVE EQUIPMENT (PPE): Provide personal protective equipment to reduce the risk.** The hazard is controlled through the wearing of items such as laboratory coats, safety glasses, facemasks or gloves. This control works only if the equipment is effective and is worn correctly.

4. MONITOR, REVIEW AND DOCUMENT THE EFFECTIVENESS OF THE CONTROL MEASURES:

It is important to conclude whether risks are adequately controlled before proceeding with the activity. If the control measures are not fully effective, then the 4-step risk assessment process begins again. If there are significant or uncertain risks that cannot be adequately controlled then the activity should not be carried out.

Risk control measures are subject to periodic monitoring and review to check their effectiveness and to ensure that no new hazards are created. All control measures should be supported with documented procedures, training, instruction and supervision in line with the WHS Act and Regulations. Consideration should be given to frequent consultation with staff, routine inspections and testing of equipment and the provision of training to maintain currency in policy and procedures.

Directions for completing the Science ASSIST Risk Assessment template**

1. **Record activity details**
   Record relevant details of the activity. When noting the year group consider the class size, ability level, any behavioural/special needs issues e.g. medical conditions of the students.
2. **List all equipment and substances in column 1**
   Carefully read through the activity protocol and identify and list:
   a. All physics and general equipment used in the activity including basic laboratory items
   b. All chemicals used and produced in the activity.
   c. All biological and geological materials used in the activity.
3. **Identify the type of hazard in column 2**
   Identify the hazards that are associated with the listed equipment and substances. Consider how the equipment or substance is used. More than one box may be crossed if multiple hazards are identified. Current SDS should be consulted for each of the chemicals used and produced along with equipment manuals and policies and procedures pertinent to individual schools. Use the 'Other' box to add details of additional hazards identified that are not listed.
4. **Assess the risks and identify controls and other measures in column 3**
   Assess the risk of any harm that may occur to people, property or the environment from the hazards identified using a risk matrix. Identify any control measures that may eliminate or minimize the risks. The choice of control should be guided by the hierarchy of risk control principles: If it is not practicable to eliminate a risk, then it is controlled by working through the other alternatives. More than one control measure may be required.
5. **Use the 'Other' box to add details of additional controls identified that are not listed.**
6. **Identify waste produced**
   List all the waste produced in the activity. Determine the appropriate disposal procedure for the waste produced by following local and state government guidelines and individual school policies and procedures. Consult Section 13 of each chemical SDS for how to correctly dispose of the chemical. More than one disposal procedure may be required. Use the 'Other' box to add details of additional disposal procedures identified that are not listed.
7. **Confirm Standard Operating Procedures**
   Confirm that the appropriate documentation has been read and understood for the activity. This may include some or all of the following: Standard Operating Procedures, Safety Data Sheets, equipment manuals, school policies and local and state guidelines. Indicate any further relevant information in the 'other comments' section.
8. **Conclusion**
   - If the assessment concludes that there are no significant risks or there are some risks but they can be adequately controlled, then the activity may be carried out after it has been signed off by the person carrying it out and authorised by a supervisor or head of department.
   - If the assessment concludes that there are significant or uncertain risks that cannot be adequately controlled then the activity should not be carried out. Further assessment of the risks and change of protocol or an alternative activity should be sought.
9. **Review**
   Risk assessments should be reviewed regularly to check their effectiveness and to ensure that no new hazards are introduced.

** The Risk Assessment assumes that the activity will be conducted in a science teaching area with the following facilities: electricity, running water, emergency shut-offs for electricity, gas if applicable, and water, regular testing and tagging of portable appliances; emergency contingencies such as evacuation/emergency plans, appropriate fire extinguishers, spill kits, hand washing facilities, eyewash/safety shower and first aid supplies. It is also assumed that all the necessary licensing requirements and approvals are obtained prior to the activity.

Related links

- Science ASSIST Risk Assessment template, Science ASSIST website http://assist.asta.edu.au/resource/2298/risk-assessment-template

- Links to jurisdictional risk management information:

  ACT: ACT Department of Education and Community Services 'Guidelines for risk management in ACT government senior school programs', 2001. Section 2 https://index.det.act.gov.au/resources/pdf/ipm_Science_Guide.pdf (password protected)

  NSW: NSW Department of Education and Communities 'Chemical Safety in Schools (CSIS)' resource package. NSW DEC website http://www.dec.nsw.gov.au/ Volume 1, Section 1.5 DEC Intranet, login required.

  NT: Northern Territory Government 'The Risk Management Process' NT Department of Education website http://www.education.nt.gov.au/__data/assets/pdf_file/0011/4106/risk_management_process.pdf (Accessed August 2015)

  QLD: Organisational Health, Queensland Department of Education Training and Employment 'Health and Safety Risk Assessment template' Qld DETE website http://education.qld.gov.au/health/docs/healthsafety/health-safety-risk-assessment-template.doc (August 2012)

  Organisational Health, Queensland Department of Education Training and Employment 'Making Health and Safety Risks V.1' Qld DETE website http://education.qld.gov.au/health/docs/healthsafety/managing-health-safety-fact-sheet.pdf (August 2012)

  SA: Health and safety services, SA Department of Education and Children's Services 'Risk Assessment Matrix' www.decd.sa.gov.au/docs/documents/1/riskassessmentmatrix.doc (July 2006

  Vic: Victorian Department of Education and Early Childhood Development 'Risk analysis tools' http://www.education.vic.gov.au/documents/school/principals/safety/sgformriskanalysistools.doc

  WA: 'Policies Risk and Business Continuity Management' WA Department of Education and Training http://www.det.wa.edu.au/policies/detcms/policy-planning-and-accountability/policies-framework/policies/risk-and-business-continuity-management.en?oid=au.edu.wa.det.cms.contenttypes.Policy-id-9351425 (June 2015)

- Links to the health and safety legislation that covers your school see:
  'AIS:Links – Workplace Health and Safety (WHS)' Science ASSIST website http://assist.asta.edu.au/resource/650/ais-links-%E2%80%94-workplace-health-and-safety-whs (May 2014)

- Links to other support materials see:
  'AIS: Links — Risk assessment and hazard management', Science ASSIST website
  http://assist.asta.edu.au/resource/651/ais-links-%E2%80%94-risk-assessment-and-hazard-management (October 2014)

References

[1] Safe Work Australia 'How to manage work health and safety risks – Code of Practice', Safe Work Australia website
http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/633/How_to_Manage_Work_Health_and_Safety_Risks.pdf (December 2011)

[2a,b] AS/NZS 2243.1 2005 *Safety in laboratories Part 1: Planning and operational aspects.* These extracts from AS/NZS 2243.1 2005 Safety in laboratories Part 1: 'Planning and operational aspects' reproduced with permission from SAI Global Ltd under Licence 1407-c117

[3] Northern Territory Government. 'Risk Management Process' NT Department of Education website
http://www.education.nt.gov.au/__data/assets/pdf_file/0011/4106/risk_management_process.pdf
(Accessed August 2015)

AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines
http://infostore.saiglobal.com/store/Details.aspx?ProductID=1378670

Australian Government ComLaw 'Work Health and Safety Act 2011' ComLaw website
http://www.comlaw.gov.au/Details/C2013C00253 (May 2014)

Australian Government ComLaw 'Work Health and Safety Regulations 2011' ComLaw website
http://www.comlaw.gov.au/Details/F2012C00904 (December 2012)

'Do a Risk Assessment' Office of Regulatory Services, Worksafe ACT website
http://www.worksafety.act.gov.au/page/view/1039 (September 2014)