

Chapter 2

Emergency Preparedness and Response

OVERVIEW

This chapter provides information and strategies to prepare for contingencies in the science classroom, laboratory and science preparation areas. The chapter includes sections on planning emergency responses, responding to accidents and medical emergencies, and preparing accident reports.

GENERAL SAFETY AUDIT

A general safety inspection can be a good starting point for preparing to deal with emergencies that are more likely to occur in or impact science classrooms. Typically this inspection would be done as part of the larger school emergency planning process, and would include a thorough evaluation of general safety concerns such as fire prevention and response, as well as response to medical emergencies, gas leaks and other situations. In addition, special attention would be given to areas where chemicals are stored and used, since extra precautions and equipment are involved in these locations. An inspection checklist could be developed to assist in this process and to ensure that nothing is overlooked. See Appendix D for a sample inspection checklist devised for use in assessing safety in the chemical laboratory area.

EMERGENCY PREPAREDNESS PLANNING

Part 7 of the *Occupational Health and Safety Code* specifies that every workplace, including schools, must develop and implement an on-site emergency preparedness or response plan. Such a plan establishes procedures to deal with different kinds of emergencies and is tailored to the specific design, circumstances, and nature of the hazards of the school. Procedures must also tend to special needs students, for example, if they are an integral part of the school population. Any emergency that threatened the safety of students

or staff would then be dealt with according to this plan. Before engaging in the development of such a plan, review Part 7 of the *Occupational Health and Safety Regulation*, AR 62/2003, for the broad outline of what must be addressed by the plan and reference Part 2 of the *Occupational Health and Safety Explanation Guide* for more detail. Topics to be covered as identified in the Guide are:

- Hazard Assessment
- Hazard Elimination and Control
- Emergency Response
- Worker Training
- Incident Investigation.

Considerations in Emergency Preparedness Planning

Emergency plans address a number of different safety hazards and emergency situations. As a minimum, the plan would include the following:

- safety measures for fire, including prevention measures specified in the *Alberta Fire Code*, 1997, district regulations or elsewhere, and procedures to follow in the event of a fire in a science laboratory or elsewhere
- a building floor plan showing where all toxic substances are located
- procedures for dealing with the release or spill of toxic substances
- procedures for responding to a natural gas or propane leak
- procedures for responding to accidents and medical emergencies
- plans to ensure staff receive adequate orientation and training.

Creating Your Own Emergency Plan

A model plan should contain the following elements:

Statement of Purpose. A brief description of what the plan is intending to achieve is necessary to set planning parameters and to establish a benchmark against which all subsequent action is taken. In other words, if an event can be handled with day-to-day resources and procedures, it does not belong in the plan.

Concept of Operations. An overview of how the plan functions and its relationship to other activities helps rearrange the organizational framework needed for managing the situation. A classroom emergency plan could provide direction for a problem to be handled by an individual teacher within certain parameters. When conditions exceed those parameters, a school team of officials could establish control and provide direction and support to the affected area. If the problem affects the school at large, then the plan is interfaced with the district or the community emergency or crisis management plan.

Risk Assessment. To assist in developing adequate arrangements, a thorough risk assessment should be completed. Minimize the assessment process to those hazards/threats that actually warrant activation of the plan and include them in the document.

Authority. A reference to specific legislation / regulation / policy gives legal expression to the plan.

Activation. The conditions that must exist for the plan to be activated should be clearly stated. Care is required to avoid ambiguity often inherent in such statements. This can be overcome by stating routine conditions that do not justify activation of the plan along with the crisis conditions that mandate activation.

Notification. A means of alerting key officials about the onset of a crisis situation is highly recommended as a routine for quickly assembling a pre-designated crisis management team once the plan is activated. This may be part of a larger Communications Plan, but still must be included separately.

Centralized Control. A location for the crisis management team(s) to work from should be designated and prepared in advance as well as consideration for an alternate location. People in crisis like to know where the leadership team is at all times, and how to contact them.

Self-assessing. The plan should be self-assessing. This means a checklist of questions by which you can determine if the plan meets your needs or requires updating.

1. Check Sheets

These sheets outline the actions that should be taken when the plan is activated. Actions are listed in order of priority and can be used to assign key roles to individuals.

2. Appendices

The appendices contain the working documents that supplement the procedures defined in the Check Sheets.

3. References

This section provides a list of other resources that would be useful in designing an emergency plan.

Sources of Emergency Plans

As they develop or review their plans, schools may find it useful to consult the various models available on the World Wide Web. These models follow the generally accepted planning design principles, and are recommended only as a guideline to help school disaster planners develop, implement, assess and revise their emergency plans. In Alberta, Municipal Directors of Disaster Services are quite often available to assist with interpreting and applying planning strategies, taking into account each school and board's unique resources and the community emergency response support mechanism. Staff can also assist with reviewing drafts and evaluating existing plans.

Some useful resources and templates can be found at:

<http://www.ccep.ca/cceptemp.html>

<http://www.ema.gov.au/agd/ema/emaSchools.nsf>

Evaluating Your Emergency Planning

To evaluate whether your emergency preparedness planning is adequate, consider whether your plan is realistic, comprehensive and appropriate for the workplace and includes measures for implementation. With effective emergency planning:

- all potential emergencies are mentioned in the plan but it is the most probable events as determined by the hazard analysis and risk assessment that are developed into contingency arrangements
- the required supplies and equipment, e.g., fire extinguishers, respirators, first aid kit, are available and in good condition
- there is an effective process to announce the emergency to all staff members, students and visitors
- drills are carried out periodically testing response to one incident at a time
- records and evaluation of drills indicate that the plan is feasible
- staff members understand the plan
- staff members are aware of their roles if there is an incident or if an evacuation is necessary; staff and their back-ups are sufficiently trained to carry out these roles
- the required number of staff are trained in emergency and standard-level first aid
- all staff members are trained and prepared so that they know how to declare an emergency and initiate the alarm, and how to determine the required level of response; e.g., standby, escalation, evacuation or take cover.

Responding to Fire

A response procedure for a school fire would address the following elements:

- when to sound the local fire alarm
- when and how to evacuate the school (for example, would an appointed person take the building's Emergency Services Kit with them to the Command Centre?)
- who is responsible for notifying the fire department and school superintendent
- under what circumstances staff members may attempt to extinguish the fire, and procedures for doing so
- when and how to permit people to re-enter the building, or to carry out further evacuation procedures if staff and/or students will be unable to return
- procedures for securing utilities
- responsibilities and procedures for filing written reports with the supervisor of schools and the Fire Marshal.

Responding to Toxic Substance Leaks and Spills

The response plan should include procedures for emergency response to leaks and spills of toxic, caustic and reactive substances, particularly those that pose an immediate danger due to the quantity and location of the spill. The emergency plan should include:

- when and how to evacuate
- who is responsible for requesting emergency services and informing appropriate school officials
- procedures and responsibilities for providing the appropriate MSDS to the emergency responder, hospital or physician
- procedures and responsibilities for reporting the leak or spill and completing any follow-up investigation.

For spills of small quantities of less dangerous substances, a full emergency response may not be required. See Chapter 7 for clean-up procedures.

Responding to a Natural Gas or Propane Leak

Natural gas and propane are flammable gases that are used as fuels in science laboratories. Both are delivered under pressure. Any leakage of gas from pipes or fittings creates a risk of fire and/or explosion, particularly if the leakage is in a confined area, and especially if it remains undetected for some time. A slow continuous leak can lead to migration of gas through a room or building until it reaches a source of ignition, resulting in an explosive flash back to the source. A fire near the source of a leak may also cause the gas container or pipe to explode.

Emergency planning should address the following elements for natural gas or propane leaks that cannot be immediately stopped:

- when and how to evacuate the area
- who will alert the fire department and school district officials
- under what circumstances staff members may attempt to localize and/or dissipate the leaking gas, and procedures for doing so.

RESPONDING TO ACCIDENTS AND MEDICAL EMERGENCIES

To handle medical emergencies and serious injuries, each school is required by Occupational Health and Safety to have staff with emergency or standard-level first aid training. These individuals would have the expertise to administer the Heimlich maneuver, mouth-to-mouth breathing and cardiopulmonary resuscitation (CPR).

This section outlines first aid for both minor and major injuries that are most likely to occur in the science laboratory or classroom. Included are the first steps to alleviate damage and to treat the injury, as well as when to engage local emergency services. School districts may have additional procedures or regulations for responding to medical emergencies.

Corrosive chemical on the skin

Be familiar with the first aid measures given in the MSDS for chemicals used. The general rule is to wash the area immediately and thoroughly with cool water, or soap and water. The recommended time for this washing is 15–20 minutes. Remove contaminated clothing. If significant harm is detected or suspected, seek medical assistance.

Splashes into the eyes

Immediately flood the eye(s) with a gentle stream of cool water for 15–20 minutes, holding the eye(s) open if necessary. Close the eyelid and cover with a loose, moist dressing. Proceed to get medical help to assess the condition of the eye(s) and ensure no further damage occurs. Alkalis produce more serious burns than acids, but flushing should be done immediately regardless of the substance.

Foreign object in the eye

If no help is available, try to flush the eye clear on your own. Position an eyecup or small clean glass of water with its rim resting on the bone at the base of the eye socket and pour the water in, keeping the eye open. If you cannot clear your eye, seek emergency medical help.

To help a person with a foreign object in their eye:

Keep the person from rubbing their eye. Wash your hands. Seat the person in a well-lit area. Try to locate the object in the eye visually. Examine the eye by gently pulling the lower lid downward and instructing the person to look upward.

Reverse the procedure for the upper lid. Hold the upper lid and examine the eye while the person looks downward.

If the object is on the surface of the eye, you may be able to flush it out or remove it manually. While holding the upper or lower lid open, use a moistened tissue or the corner of a clean cloth to remove the object by lightly touching it. Once removed, flush the eye with a saline solution or lukewarm water. If you cannot remove the object easily, cover the eye with a soft cloth and seek emergency medical assistance.

If the object is embedded in the eye, do not remove the object. Apply a dressing over the eye in such a way that it does not make direct contact with the eye surface. Cover the dressing with a cup or ring pad, and seek emergency medical assistance.

If pain, vision problems or redness persists, seek emergency medical help.

Cuts

Put on disposable gloves to minimize risk of infection from the blood. If necessary, wash minor cuts with cool water to remove any foreign material, dry the area and cover with a bandage. In the case of major cuts with severe blood loss, apply a large compress, then apply direct pressure with the heel of your hand and transport to the hospital. If a piece of glass or other sharp object is imbedded in the wound, tent dress the area and add padding around the injury until it is higher than the imbedded object. Secure padding with a wrapping of gauze and seek medical help. For major cuts with minor bleeding, cover with a gauze pad, then transport the victim to hospital for further medical help. If glass or any other sharp object may still be in the wound, do not attempt to remove it. Be careful not to put undue pressure on the gauze while transporting the victim, since circulation may be cut off completely.

Ingestion of chemicals

The primary source of information in Alberta on prescribed treatment for ingested chemicals is the Poison and Drug Information Services, Foothills Hospital, Calgary; telephone: 403-944-1414 or 1-800-332-1414. They are on 24-hour call every day of the year. They should be called immediately if ingestion of a chemical occurs before proceeding with any treatment.

Another source of information on treatment would be found on the MSDS on file for the chemical. However, inconsistency in the treatment prescribed does occur depending upon the source of MSDSs. As well, it may not be consistent with that prescribed by the Poison and Drug Information Services. Note that the standard procedure to have the victim drink plenty of milk or water is no longer recommended.

Burns

Treatment of minor burns is basically a three-step process. Cool the burned area for about 15 minutes by running cool water over it, immersing it in cool water or cooling with a cold compress. Do not use ice for this time period as this may freeze the area of treatment. Apply a triple-antibiotic ointment or a moisturizer primarily to prevent drying. Loosely wrap the burned area with a sterile gauze bandage, avoiding excess pressure on the burned skin. If the burn is severe, cool the area as described above, wrap loosely with a moist dressing and transport the person to a hospital for medical assistance. If in doubt, seek medical assessment and/or treatment.

Burning clothing

Rapid action in extinguishing burning clothing is critical to minimizing exposure of the victim, and minimizing harm that may result. Several approaches are sometimes used and your local fire department or school district policy may recommend one of these as the preferred response. The “Stop, Drop and Roll” method is commonly recommended by fire departments. In conjunction with this technique, other heavy clothing or a fire blanket may be used to smother the flames. Fire blankets are not a Fire Code requirement and are not recommended by all fire departments. If a blanket is used, it must be removed immediately after the fire is out to minimize trapping of heat and sparks against the victim's skin. Other options for extinguishing burning clothes include the use of an ABC dry-chemical fire extinguisher, spraying the victim with water or using an emergency shower, if available. Selection of any one of these options may be circumstantial; the use of the fire extinguisher, for example, may not be practical from a safety perspective if the fire is near the facial area and chemical spray will get into the victims eyes.

Once the fire is extinguished loose clothing can be removed if necessary, but any clothing adhering to the burned skin should not be removed. After the fire is out, follow the procedures for responding to burns described above.

Shock and fainting

Lie the person down if he or she is in shock and elevate the feet higher than the head. Loosen tight clothing, cover the person with a blanket and talk to him or her reassuringly. Do not give them anything to drink. If the person has fainted, place him or her in the *recovery position*; i.e., on their side with the head tilted back to keep the airway open. Ensure that the airway is clear and that they are breathing. Make the head comfortable, cover the person with a blanket, and leave him or her lying down. If there is a chance of injury due to the collapse, avoid moving the person if they are breathing until you can communicate with him or her to confirm no injury was sustained. On the other hand, if the airway is blocked and/or the victim is not breathing, the head may have to be tilted back or the victim may have to be laid on their back to begin artificial resuscitation or CPR. If other injuries are present or any symptoms persist, seek emergency medical assessment and/or treatment. If the casualty must be left alone, always place the victim in the recovery position, and ensure the airway is open.

Inhalation of toxic fumes

Move victim into fresh air and contact the Poison and Drug Information Services, Foothills Hospital, Calgary; telephone: 403-944-1414 or 1-800-332-1414 for information on treatment of victim.

If available on site, summon trained personnel who can administer oxygen and other medical procedures, as necessary. In severe cases, seek further medical treatment at a hospital.

Other medical emergencies

Being prepared to deal effectively with emergencies involving serious existing medical conditions such as asthma, anaphylactic shock, diabetes or epilepsy requires open communication between school administration, counsellors and parents. Teachers need to know if students have these conditions, as well as what to look for and what to do if the student becomes symptomatic. Basic training could be provided to assist teachers in dealing with, for example, seizures or insulin shock. If in doubt, seek medical assessment and/or treatment.

ACCIDENT REPORTING

An *accident* is an undesired event that causes or may cause harm to individuals, property or the environment. When an accident occurs, the first concern is the injured. Priority can then be placed on systematic investigation and proper reporting of the accident.

By law, certain work-related accidents must be reported as soon as possible to Alberta Workplace Health and Safety. Section 18 of the *Occupational Health and Safety Act* requires employers to:

- report certain injuries or accidents, including any injury or accident that results in a fatality or in a worker being admitted to hospital for more than two days
- report any unplanned or uncontrolled explosion, fire or flood that causes (or could cause) a serious injury
- conduct an investigation whenever a serious injury or accident occurs, and prepare a report that is available for inspection.

Accidents involving workers that fall under the jurisdiction of the *Workers' Compensation Act* must also submit a report to the Workers' Compensation Board within 72 hours of the incident. Laboratory aides and technicians fall under the scope of the Act; whereas teachers do not, except when teaching Career and Technology Studies (CTS) courses. Principals and assistant principals fall under the Act if teaching CTS courses or if injured while involved in nonteaching activities. Students do not fall under the Act unless on approved off-campus education programs, such as work experience. The *Workers' Compensation Act* requires both the employer and the employee to report injuries that result in the loss of at least one full day's work, and all injuries that require medical aid.

Both Occupational Health and Safety and the Workers' Compensation Board may choose to investigate the accident.

Schools can improve safety and show compliance with accident reporting requirements by ensuring that:

- all accidents and injuries are recorded, reported and investigated as appropriate
- staff know when and how to report accidents, including where to access reporting forms and instructions
- staff know what kinds of accidents will be investigated
- staff receive appropriate orientation and training and understand their responsibilities
- all required information is gathered and provided by supervisors for staff compensation claims
- general pre-planning has been done regarding accident investigation and reporting
- the underlying causes of accidents are determined
- measures are taken to prevent accidents from reoccurring.

See Appendix E for a sample Accident/Incident Report Form. This sample shows the type of information that is required in an accident report, as well as who is required to complete the report.

Near-miss Reporting

A near-miss is an event that could, but does not, result in an accident. Near-misses are also referred to as incidents or potential accidents.

Like accidents, near-misses are caused by unsafe acts or conditions. Examples of unsafe acts include handling of materials by someone without proper training, and failure to use personal protective equipment such as safety glasses. Examples of unsafe conditions include poor lighting, excessive noise and poor housekeeping.

Documentation of near-miss situations, although not required by law, should be done internally with the information on the incident shared with colleagues. In this way, near-miss reporting is a proactive means of improving safety awareness, identifying and tracking potential hazards and ultimately preventing accidents. Whenever a near-miss is recorded, it is important to identify, as far as possible, the unsafe acts and conditions that contributed to the incident. Actions can then be taken to reduce the risk of a similar incident or accident occurring in the future.

Accident/Incident Report Form

Part A – to be completed by individual(s) directly involved or injured in the incident.

Medical Aid Lost Time Spill/Contamination/Environmental Release
 Near Miss Property Damage

IDENTIFY – Person(s) involved _____ Date and time of Incident _____ AM / PM

First Name _____ Last Name _____ YR _____ MO _____ DD _____ HH:min _____

Date & Time of Medical Evaluation: ____/____/____ ____:____
YR MO DD HH:mm

School Nurse
 Hospital
 Clinic or Family Physician

Exact details of injury/illness & treatment (eg. Body part involved, cut, strain, bruise, illness symptoms and date of onset, etc.)

W.C.B. Form: (Please check) Has been prepared and forwarded Not required

Description of Incident (Add additional pages if necessary)
 State exactly the sequence of events leading to the incident, where it occurred, what the person was doing, the size, weight and type of equipment or materials involved, etc.

WITNESSES (if any)

NAME	DEPARTMENT	PHONE #

PROPERTY DAMAGE

Identify property involved. Give machine name, too name, etc.	Description of damage or loss	Estimated value of loss

(over)

Parent/Guardian to notify: _____, phone #: _____

Completed by: _____ Date: _____
Print Name

_____ Signature **Forward to Supervisor Immediately**

Part B – to be completed by Supervisor within 24 hours

Why did it happen? (conditions and/or actions contributing to injury / incident).

Parent/Guardian Notification: Name: _____
 Date: _____
 Time: _____

Corrective Actions to Prevent Re-occurrence	Action by whom & Date to be completed

Investigated by: _____ Title: _____
 _____ Signature Phone #: _____ Date: _____

(over)

