Chapter 5: Workplace Hazardous Materials Information System (WHMIS)

Overview

WHMIS is a provincial legislative response to provincial employees' and employers' rights to know about the safety and health hazards of the materials they use in the workplace. This system and supporting documentation also provide sufficient information to ensure that people work safely with these materials. This chapter provides WHMIS classifications as well as information related to MSDS and labelling of chemicals.

> **Notes**
>
> A Globally Harmonized System (GHS) of classifying and labelling chemicals is in the process of being implemented in Canada. The GHS will not replace WHMIS, but WHMIS will be modified to incorporate this new, international system. This will mean changes to some of the WHMIS symbols, supplier labels, as well as MSDSs. However, the roles and responsibilities for suppliers, employers, and workers will not change significantly. The goal is to have updated WHMIS laws by June 2015. Information sheets on the proposed changes can be accessed at <www.ccohs.ca/products/publications/whmis_ghs/>.

WHMIS

Teachers, students, custodians, and other staff may be exposed to hazardous materials. Such exposure can cause or contribute to serious health effects. In addition, some hazardous materials may pose immediate physical or chemical risks, such as causing a fire or an explosion. WHMIS informs school staff about, and protects them from, such risks.

Although students are not specifically referred to in WHMIS, except in the case of registered apprenticeship or work experience programs, their presence in the school workplace suggests that a level of care be provided consistent with WHMIS standards. This suggests that students should be made aware of any potentially hazardous materials in areas accessible to them, and provided training in the safety skills needed to use these materials. The safest and most practical approach is to manage the environment so that student access to these materials is limited to times of teacher supervision.

The following are the three major components to the WHMIS:

1. **Labels** applied to containers of hazardous materials (called "controlled products" in the legislation). The labels alert the user to the dangers of the product and to the essential precautions for its safe use.
2. **Material Safety Data Sheets (MSDSs)** are prepared by the product supplier and supplied to the user. These sheets provide detailed information about

product composition, reactivity, health effects, protective equipment and procedures, and emergency procedures.

3. **Education and Training** related to hazards and associated safe work procedures is mandatory for those either working with or working in the proximity of the controlled product. The employer is responsible for developing a safe environment for staff, students, and whoever may be present on school premises. It is expected that all teachers and other staff members handling controlled products be trained sufficiently to use the information and training to protect themselves and the people on premises, including students. This training must be generic, as well as product- and site-specific, so that staff members know what hazardous materials they will encounter in their work location. Since the site-specific component of WHMIS training differs from school to school, science teachers who move to a new school should go through a safety orientation that covers such detail without having to repeat the generic WHMIS training. Training must also be job-specific and tailored for the trainees. A record of all training should be kept. WHMIS regulations require that training programs are reviewed annually or more frequently as needed.

Training of science teachers and support staff in WHMIS would generally include the following, with the addition of site-specific safety:

- legislation that regulates or defines safety standards in the school, particularly Workplace Safety and Health, environmental protection, WHMIS, and fire protection regulations
- due diligence and staff responsibilities
- school and/or district safety policies for science classrooms, laboratories, and field trips
- safety equipment, location, and use
- management of chemicals: location and safe storage, specific risks, safe use of controlled products, and disposal of chemicals
- location of MSDSs and how to read them
- response to spills and spill clean-up
- response to accidents, including first aid procedures
- accident and near-miss reporting procedures
- review of basic laboratory techniques and identification of inherent hazards (See Appendix F for examples of such techniques and their hazards.)

Notes

The provisions of the WHMIS legislation with respect to laboratory chemicals (under 10 kg) are slightly different than those dealing with industrial chemicals.

Information, as well as a student evaluation related to WHMIS, can be found in the support document *Keeping Your Facilities SAFE*, which is available on Manitoba Education and Advanced Learning's website at <www.edu.gov.mb.ca/k12/cur/science/index.html>.

All controlled products sold after October 31, 1988, must meet the legislated labelling, MSDS, and worker education requirements or the product cannot be used, handled, stored, or prepared for disposal.

The WHMIS definition of controlled product does not apply to radioactive materials, pesticides, explosives, consumer products, or materials covered under food and drug legislation (with respect to labels and MSDS, as a condition of sale).

Figure 4 **WHMIS Classifications and Symbols**

Classes and Divisions	Hazard Symbol
Class A—Compressed Gas	
Class B—Flammable and Combustible Material	
Class C—Oxidizing Material	
Class D—Poisonous and Infectious Material 1. **Materials Causing Immediate and Serious Toxic Effects**	
Class D—Poisonous and Infectious Material 2. **Materials Causing Other Toxic Effects**	
Class D—Poisonous and Infectious Material 3. **Biohazardous Infectious Material**	
Class E—Corrosive Material	
Class F—Dangerously Reactive Material	

Labelling

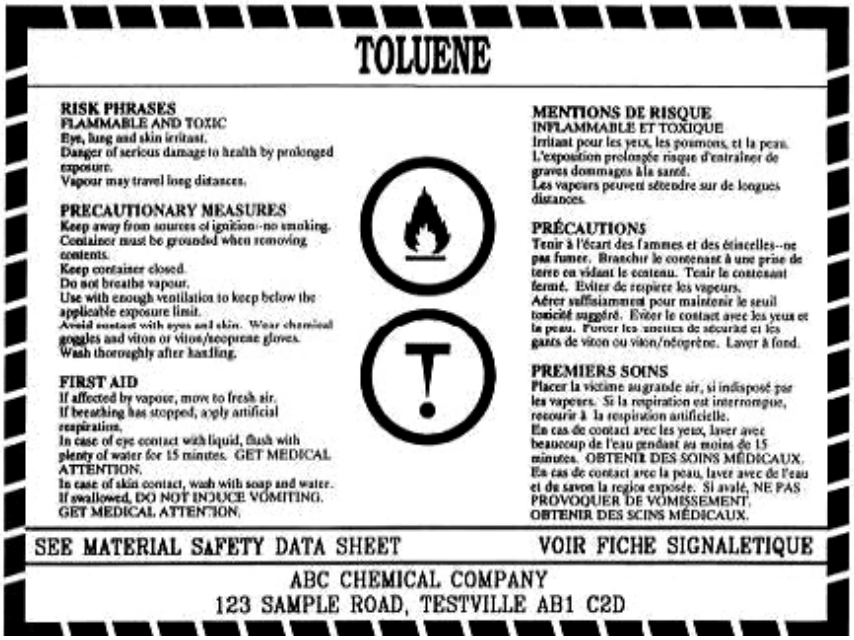
Proper labelling is one of the most important aspects of an effective and safe laboratory operation. Chemicals kept in the storeroom and materials that are generated in the laboratory for and by student experiment require proper labelling.

To protect handlers of potential hazards, labels must present the information clearly and legibly. The formal "supplier label" contains the following **seven elements** of information inside **a distinctively marked border:**

- product identifier
- supplier identifier
- WHMIS hazard symbol(s)
- risk statement(s)
- precautionary statement(s)
- first aid information
- a reference to the MSDS

Laboratory chemicals from a recognized supply house may carry less information on the label (i.e., WHMIS symbols, distinctively marked border, and the supplier identifier). For example:

Figure 5 ***Chemical Label***



Labelling Chemical Containers

All chemical containers, including the original container, must be labelled in such a way as to clearly identify the contents.

Inside the laboratory: Small transfer containers and reaction vessels containing mixtures, solutions, or reaction products **must have a clear identifier**, usually the chemical name and date.

Outside the laboratory: Transfer containers **must carry a workplace label**. This form of label has three components:

- the chemical identifier
- instructions for safe use (combination of risk phrase and precautionary statement)
- a reference to the MSDS

Acceptable Format for the Workplace Label

Product Identifier
Phrases for Safe Handling Information
See Material Safety Data Sheet

Additional Labelling Requirements for Transportation

The federal *Transport of Dangerous Goods Act* (TDG) and the Manitoba *Dangerous Goods Handling and Transportation* Act outline the regulations for transporting dangerous goods and hazardous waste. According to paragraph 3 of the Manitoba Act: (http://web2.gov.mb.ca/laws/statutes/ccsm/d012e.php)

> No person shall handle or dispose of dangerous goods or cause dangerous goods to be handled or disposed of except in compliance with this act and the regulations.

Material Safety Data Sheets

Material Safety Data Sheets (MSDS) must be supplied with all chemicals. Manufacturers routinely provide online information, electronic media, or data sheets with their products. Teachers and students should be familiar with the type of information contained on a MSDS and be able to interpret the sheets from a variety of chemical suppliers. Although the numbering of sections and the order of appearance may differ from supplier to supplier, the following must be on each MSDS:

I. PRODUCT IDENTIFICATION AND USE
Manufacturer's name
Supplier's name

II. HAZARDOUS INGREDIENTS

III. PHYSICAL DATA
Colour, form, solubility
Melting and boiling points
Vapour pressure, specific gravity

IV. FIRE AND EXPLOSION DATA
Flammability
Flashpoint
Firefighting procedures

V. REACTIVITY DATA
Stability and hazards

VI. TOXOLOGICAL PROPERTIES
Threshold Limit Values (TLV)
Effects of exposure
Carcinogenicity

VII. PREVENTATIVE MEASURES
Protective clothing
Protective equipment
Spill and handling procedures

VIII. FIRST AID MEASURES

IX. PREPARATION DATE OF MSDS

Teaching Students about MSDS

It is important that students have practical experience interpreting samples of MSDSs. A sample activity and resource sheets are available on Manitoba Education and Advanced Learning's website at <www.edu.gov.mb.ca/k12/cur/science>.

National Fire Protection Association (NFPA) Labelling

Other labels that may be seen include these NFPA symbols. A scale of 0 to 4 indicates the level of danger for each of the following categories: health, flammability, and reactivity. In addition, a special precautionary symbol may be used where necessary.

Figure 6 **NFPA Label**