

Community-Based Learning: Workplace Health & Safety



An Introduction to WHMIS

WHMIS: It really does mean something!

- What is WHMIS?
- How can WHMIS protect me?
- What are my employer's WHMIS responsibilities?
- What are my WHMIS responsibilities?



WHMIS is...

**Workplace
Hazardous
Materials
Information
System**

W H M I S



WHMIS is a Communication System

- WHMIS is Canada's system to talk about hazardous ("controlled") materials in the workplace.
- WHMIS is law in every province and territory.
- WHMIS Regulations are part of Nova Scotia's Health & Safety Act.



WHMIS is about working safely around hazardous materials!

WHMIS has Three Parts:

1. Labels

2. Material Safety Data Sheets (MSDS)

3. Worker Training



WHMIS labels, MSDS and training are how we talk and learn about working safely with controlled products!

WHMIS Part 1 - Labels



WHMIS Labels = there are 2 kinds!

Before a hazardous (or 'controlled') product arrives and is accepted at your workplace, the supplier must affix a **Supplier Label**.



If the product, or the product container, is changed, re-mixed or re-packaged at your workplace, the employer must affix a **Workplace Label**.



Supplier Labels

Supplier labels coming in to Canada must be in French & English, and include:

- Product Name
- Hazard Symbol/s
- Risk Phrase/s
- Precautionary Measures
- First Aid Measures
- Supplier Name
- MSDS Reference

<p>METHANOL DANGER POISON FLAMMABLE VAPOUR HARMFUL MAY CAUSE BLINDNESS IF SWALLOWED</p> <p>Keep away from heat, sparks and flame. No smoking. Container must be grounded when being emptied. Vapour may travel long distance. Avoid contact with eyes and skin. Do not inhale vapours or mist. Do not take internally. Harmful if absorbed through the skin.</p> <p>FIRST AID: In case of contact, immediately, flush eyes and skin with plenty of water for at least 15 minutes.</p> <p>If swallowed, induce vomiting by sticking finger down throat, or by giving soapy water to drink. Repeat until vomit is clear.</p> <p>If affected by vapour, move to fresh air.</p> <p>If breathing has stopped, apply artificial respiration.</p> <p>GET MEDICAL ATTENTION IMMEDIATELY.</p> <p>PRECAUTIONS: Wear chemical goggles and resistant gloves. Wash thoroughly after handling. Use with enough ventilation to keep below TLV. Keep container closed. Never use pressure to empty container.</p>	 	<p>METHANOL DANGER POISON INFLAMMABLE VAPEURS NOCIVES PEUT PROVOQUER LA CÉCITÉ, SI AVALÉ</p> <p>Garder loin de la chaleur, des étincelles et de la flamme. Ne pas fumer. Brancher le contenant à une prise de terre avant de le vider de son contenu. Les vapeurs peuvent s'étendre sur de longues distances. Éviter tout contact avec les yeux et la peau. Ne pas respirer les vapeurs. Ne pas absorber. Nocif, si absorbe par la peau.</p> <p>PREMIERS SOINS: En cas de contact avec les yeux ou la peau, laver à grande eau pendant au moins 15 minutes.</p> <p>Si avalé, provoquer le vomissement en introduisant un doigt dans la gorge ou en faisant absorber de l'eau savonneuse à la victime. Répéter jusqu'à cessation du vomissement.</p> <p>Sortir au grand air, si indisposé par les vapeurs.</p> <p>Si la respiration est interrompue, recourir à la respiration artificielle.</p> <p>OBTENIR DES SOINS MÉDICAUX IMMÉDIATS.</p> <p>PRÉCAUTIONS: Porter des lunettes protectrices (pour produits chimiques) et des gant résistants. Se laver minutieusement après usage. Utiliser dans un endroit bien aéré, afin de maintenir le niveau de vapeurs tolérable. Garder le contenant fermé. Ne jamais user de pression en vidant le récipient.</p>
<p>SEE MATERIAL SAFETY DATA SHEET FOR PRODUCT VOIR FICHE SIGNALÉTIQUE</p>		
<p>ABC Company Anytown, Ontario Telephone 123-4567</p>		

Supplier Labels must be in English & French

Product Name

Risk Phrase/s



Hazard Symbol/s

1st Aid Measures

Precautionary Measures

MSDS Reference

Supplier Name

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SEE MATERIAL SAFETY DATA SHEET FOR PRODUCT VOIR FICHE SIGNALÉTIQUE		
ABC Company Anytown, Ontario Telephone 123-4567		

Workplace Labels

Workplace labels must show 3 things:

- Product **identification**/name
- **How to handle it safely**, ie. correct **personal protective equipment (PPE)** and precautions for safe use
- Availability of product **MSDS**

Example:

Acetone
Keep away from heat, sparks, and flames. Wear safety goggles and butyl rubber gloves. Use with local exhaust ventilation.
MSDS available.





Workplace labels must be clear for workers!

	Acetone	← Name
Safe handling	Keep away from heat, sparks, and flames. Wear safety goggles and butyl rubber gloves. Use with local exhaust ventilation.	
	MSDS available.	

↑
MSDS

What else must be on labels?

WHMIS Hazard symbols!

METHANOL	METHANOL
DANGER POISON FLAMMABLE VAPOUR HARMFUL MAY CAUSE BLINDNESS IF SWALLOWED	DANGER POISON INFLAMMABLE VAPEURS NOCIVES PEUT PROVOQUER LA CÉCITÉ, SI AVALÉ
 	 
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If breathing has stopped, apply artificial respiration.	Si la respiration est interrompue, recourir à la respiration artificielle.
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SEE MATERIAL SAFETY DATA SHEET FOR PRODUCT VOIR FICHE SIGNALÉTIQUE	
ABC Company Anytown, Ontario Telephone 123-4567	

PRODUCT	SUPPLIER						
CONTROLLED PRODUCT AND HAZARDS							
							
[]	[]	[]	[]	[]	[]	[]	[]
[] Harmful if swallowed	[] May cause irritation to skin & eyes	[] Flammable	[] Corrosive material	[] Possible carcinogen	[] May be fatal or cause blindness if swallowed	[] May be harmful by inhalation, ingestion or skin absorption	
PRECAUTIONARY MEASURES							
[] Avoid contact with skin and eyes	[] Wear rubber gloves, eye protection and protective clothing	[] Other					
FIRST AID							
[] If contact with skin or eyes, flush with water for 15 minutes	[] If inhaled, if breathing is difficult, give oxygen	[] If swallowed, wash mouth with water, call physician immediately.					
[] MATERIAL SAFETY DATA SHEET AVAILABLE							

Classifications & Hazard Symbols

CLASS A



Compressed Gas

CLASS B



Flammable and
Combustible
Material

CLASS C



Oxidizing
Material

CLASS D



1. Materials
Causing Immediate
and Serious Toxic
Effects



2. Materials
Causing Other
Toxic Effects



3. Biohazardous
Infectious Materials

CLASS E



Corrosive Material

CLASS F



Dangerously
Reactive Material

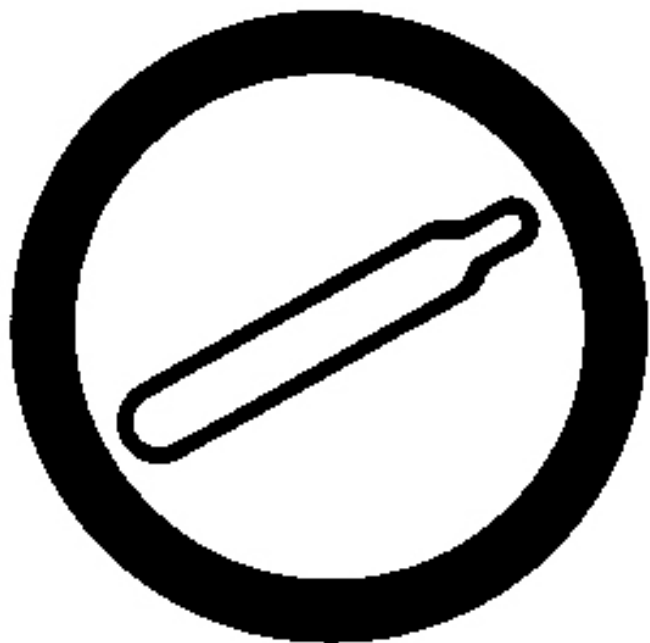
WHMIS Classes and Hazard Symbols

WHMIS symbols are on supplier labels in every Canadian workplace.

WHMIS symbols represent the dangers of hazardous products.

WHMIS uses 8 symbols for six different classes of hazardous materials.

Class A – Compressed Gas



- Any product contained under pressure, often found in gas
- Examples are propane, acetylene, oxygen, and helium. Even many spray containers in your home are packaged as a form of compressed gas!
- A container that is damaged, punctured or cracked, or that becomes very hot, can be very dangerous to be around. Look for signs of damage. Report this to your supervisor.

Class B

Flammable & Combustible Material

- A material that will ignite and keep burning if exposed to flame or another ignition source
- WHMIS details 6 forms, including gas, liquids, solids & aerosols. Examples are propane, gasoline, acetone, or solvents (ie. paint thinner)
- A container that is leaking, damaged, rusted or that is stored around an ignition source, can be very dangerous. Report this to your supervisor.



Class C – Oxidizing Material



- A material that may not burn by itself, but releases oxygen into the air which can make another material burn
- Examples are bleach, hydrogen peroxide, bromates (ie. found in pool chemicals)
- Even in sealed containers, these products must be carefully stored, often separately from other chemicals. The MSDS will show this. Always talk to your supervisor about safe storage!

Class D

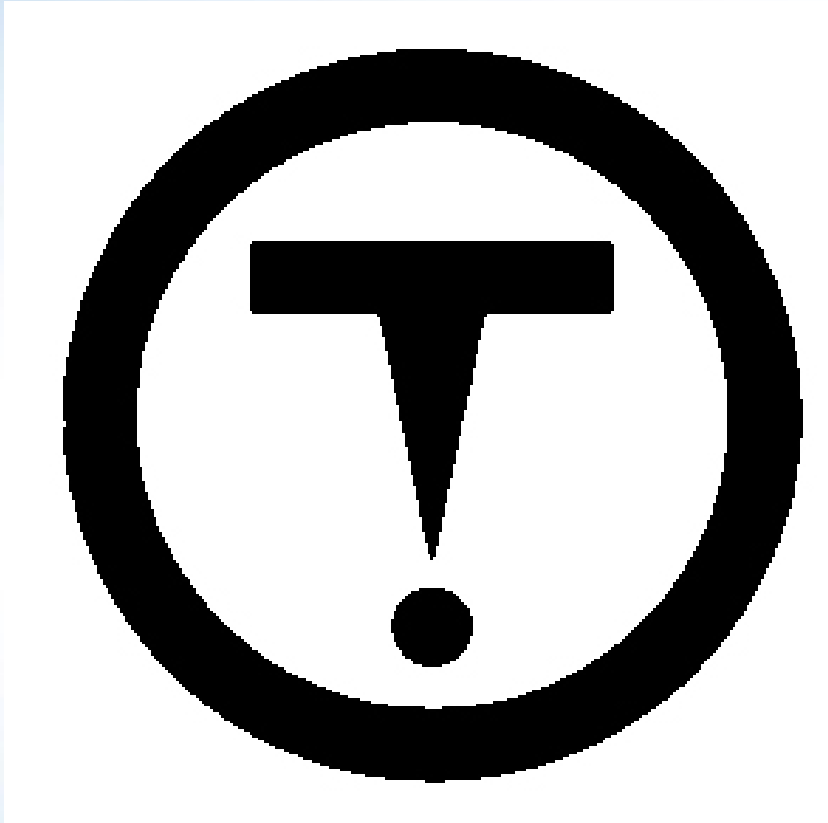
D1 - Immediate & Serious Toxic Effects

- A material that will quickly cause injury, illness, or death.
- Examples are chlorine, carbon monoxide, arsenic, cyanide, formaldehyde
- These products can cause serious injury and death in a very short period of time. **Don't handle these products until you've had your workplace training!**
Read the MSDS! Wear your PPE!
Talk to your supervisor!



Class D

D2 – Other Toxic Effects



- A material that can serious illness over a long period of time, or less serious in a short time
- Examples are asbestos, lead, mercury, fibreglass, silica
- These products will make you sick. Exposure to some of these materials can result in different cancers. Safe handling procedures and PPE that fits properly is a must! Talk to your supervisor.

Class D

D3 – Biohazardous Infectious Material

- Organisms and toxins produced by this material will cause infection and disease in humans and animals.
- Fungus (molds) like aspergillus & stachybotrys; dangerous bacteria and viruses like salmonella and HIV; and nasty skin infections like impetigo can result from D3 exposures.
- Talk to your supervisor about infection control, use appropriate PPE to protect routes of entry (eyes, nose, mouth and skin), and learn proper hand washing!



Class E – Corrosive Material



- A material that will immediately attack and burn human skin, and corrode many fabrics and metals.
- Examples are sulphuric acid (ie. battery acid), ammonia, and chromic acid which is used in industrial settings to speed other chemical reactions
- Being splashed with these products will immediately & seriously hurt you! Exposure to some can result in different cancers. **Don't handle any Class E until you've been trained** and have proper PPE! Talk to your supervisor.

Class F – Dangerously Reactive Material

- A material that often reacts dangerously and violently to being heated, shaken or pressurized, and can produce toxic gas when exposed to water.
- Examples are ethylene oxide (used to make other industrial chemicals), picric acid (which needs to be stored wet, dry it can explode!) & ethyl acrylate (used to make resins, plastics, rubber, etc.)
- This is highly unstable and dangerous material. **Don't handle Class F until you've had extensive WHMIS training** specific to these chemicals. Talk to your supervisor!



Other Symbols - PPE

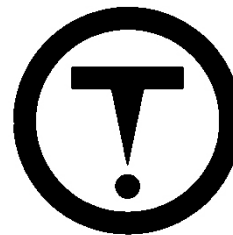
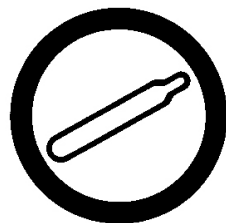
Sometimes workplace labels include symbols for the correct PPE that is suggested, or required, for safe handling of WHMIS materials.



Symbols like these aren't required by law, but when they are used along with appropriate WHMIS training programs, staying safe can be easier!

Always check the MSDS for the suggested/required/correct PPE!

Which PPE would be correct to use with which WHMIS classes?



Material Safety Data Sheets (MSDS's)

- **MSDS are information sheets that describe a controlled product.**
- **All workplaces with controlled products need MSDS.**
- **MSDS must include:**
 - Product name and use
 - Hazardous ingredients
 - Physical data
 - Fire & explosion data
 - Reactivity data
 - Toxicological properties
 - Preventive measures
 - First Aid measures
 - Date & source of MSDS



MSDS can be displayed like this!

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT IDENTIFIER ⇒ Sodium hydroxide, Caustic soda		PRODUCT IDENTIFICATION NUMBER (PIN) S-318	
PRODUCT USE ⇒			
MANUFACTURER'S NAME La Bell Industries		SUPPLIER'S NAME Omega Chemicals	
STREET ADDRESS 18 Rue LeJour		STREET ADDRESS P.O. Box 1989	
CITY Montreal	PROVINCE Quebec	CITY Sumware	PROVINCE Ont.
POSTAL CODE MON 0C0	EMERGENCY TELEPHONE NO. (522) 555-4433	POSTAL CODE C1H 201	EMERGENCY TELEPHONE NO. (416) 555-4321

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS NUMBER	LD ₅₀ OF INGREDIENT (Specify species & route)	LD ₅₀ OF INGREDIENT (Specify species)
Sodium Hydroxide	96	1310-73-2		
Sodium Carbonate (Na ₂ CO ₃)	0.5-2.5			
Sodium Chloride (NaCl)	0.0-2.1			
Sodium Sulphate (Na ₂ CO ₃)	0.02-0.1			
Potassium, Calcium, and Magnesium	0.1			
Sodium Dioxide (SiO ₂)	0.03			
Other Metals (total)	0.01			

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE Other	ODOUR AND APPEARANCE White/off-white odourless, hygroscopic	ODOUR THRESHOLD (ppm) odourless
VAPOUR PRESSURE (mm Hg) Not appl.	VAPOUR DENSITY (AIR=1) Not appl.	EVAPORATION RATE Non-volatile @ room temp
pH Not appl.	SPECIFIC GRAVITY 2.13	BOILING POINT (°C) 1388 C
		MELTING POINT (°C) 318 C
		COEFF. WATER/OIL DIS Not appl.

SECTION 4 - FIRE AND EXPLOSION DATA

FLAMMABILITY YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, UNDER WHICH CONDITIONS?		
MEANS OF EXTINCTION Although it is non-combustible, it can be hazardous in a fire area. The following should be known for fire fighting: 1) it can melt and flow when heated (mp 318°) 2) Hot or molten material can react violently with water (splattering). 3) Can react with certain metals, such as aluminum to generate flammable hydrogen gas.		
FLASHPOINT (°C) AND METHOD Not flammable	UPPER FLAMMABLE LIMIT (% BY VOLUME) Not flammable	LOWER FLAMMABLE LIMIT (% BY VOLUME) Not flammable
AUTOIGNITION TEMPERATURE (°C) Not flammable	HAZARDOUS COMBUSTION PRODUCTS Not flammable	
EXPLOSION DATA ⇒ SENSITIVITY TO IMPACT Not appl.	SENSITIVITY TO STATIC DISCHARGE Not appl.	

SECTION 5 - REACTIVITY DATA

CHEMICAL STABILITY YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> IF NO, UNDER WHICH CONDITIONS? ⇒	
INCOMPATIBILITY WITH OTHER SUBSTANCES YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> IF SO, WHICH ONES ⇒	Strong acids, many organic compounds, leather, wool, aluminum, zinc, and tin.
REACTIVITY, AND UNDER WHAT CONDITIONS	Slowly picks up moisture and CO ₂ from the air to form Sodium carbonate
HAZARDOUS DECOMPOSITION PRODUCTS	None

← **Product Name & Main Use**

← **Hazardous ingredients**

Lists the percentage amount of different chemicals in the product

← **Physical data**

Describes how the product appears, ie. form, colour, smell.

← **Fire & Explosion Data**

Describes potential for fire, explosion and fire-fighting techniques

← **Reactivity Data**

Important section that describes safe storage, etc.

PRODUCT IDENTIFIER

SECTION 6 - TOXOLOGICAL PROPERTIES

ROUTE OF ENTRY

SKIN CONTACT SKIN ABSORPTION EYE CONTACT INHALATION INGESTION

EFFECTS OF ACUTE EXPOSURE TO PRODUCT Damage to any human tissue particularly skin, eyes, and respiratory tract.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT Dust and mist can cause damage particularly to the respiratory tract.

EXPOSURE LIMITS 2 mg/m ³ Ceiling limit.	IRRITANCY OF PRODUCT Causes burning sensation	SENSITIZATION TO PRODUCT Not known	CARCINOGENICITY Not listed
TERATOGENICITY Not known	REPRODUCTIVE TOXICITY Not known	MUTAGENICITY Not listed	SYNERGISTIC PRODUCTS Reacts violently when molten

SECTION 7 - PREVENTATIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

GLOVES (SPECIFY) rubber, polyethylene	RESPIRATOR (SPECIFY) filter type	EYE (SPECIFY) goggles, face shield
FOOTWEAR (SPECIFY) boots where needed to prevent contact	CLOTHING (SPECIFY) apron where needed to prevent contact	OTHER (SPECIFY) Lab coat, overalls

ENGINEERING CONTROL (SPECIFY E.G., VENTILATION, ENCLOSED PROCESS) local exhaust

LEAK AND SPILL PROCEDURE When spilled in a dry condition, it can be promptly shovelled up for recovery or disposal. Flush surfaces with water, neutralize with diluted acid (vinegar).

WASTE DISPOSAL Disposal must meet with local requirements. Waste must never be discharged directly into sewers or surface waters. (Neutralize and dilute with much water)

HANDLING PROCEDURES AND EQUIPMENT

STORAGE REQUIREMENTS Store in well-sealed containers, have abundant water (running preferred) at hand.

SPECIAL SHIPPING INFORMATION This material is classified as **Corrosive**

SECTION 8 - FIRST AID MEASURES

SPECIFIC MEASURES

Eye Contact: Wash eyes immediately with plenty of running water for no less than 15 min. (including under the eyelids). Speed is important to avoid permanent injury. If one eye is injured, keep the injured eye at a lower level to avoid contaminating the uninjured eye.

Skin Contact: Wash contact area promptly with much water. (Dilute acetic acid, vinegar, can be used to neutralize). Remove contaminated clothing under the shower. Prolong washing until medical help arrives.

Inhalation: Remove from exposure to mist or dust and get prompt medical help.

Ingestion: Immediately phone 911 and ask for poison treatment. Describe the chemical that has been swallowed, and follow the advise of emergency personnel.

SECTION 9 - PREPARATION DATE OF MSDS

PREPARED BY (GROUP, DEPARTMENT, ETC.)	PHONE NUMBER	DATE
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Toxicological Properties *Describes how it may enter the body & potential effects from exposure*

Preventive Measures *Describes PPE and safe storage, handling & clean-up procedures*

First Aid Measures *immediate 1st Aid procedures for exposure through eyes, skin, nose & mouth*

Date & Source of MSDS *MSDS's are reviewed every 3 years*

When would you need an MSDS at work?

To know:

- the product name and **what it's for**
- whether product is **proper for the job**

- how to **safely store** the product
- how to **safely handle** and use the product

- the **correct PPE** for working with/around the product
- other preventive measures for **staying safe**
- what to do in an **emergency** involving that product:
 - * **First Aid** procedures
 - * **Clean up** procedures
 - * **Emergency information** for responders



WHMIS Part 3

Worker Education & Training



WHMIS Education & Training

- 1. Employers** must ensure that employees (including managers & supervisors) who work with or near controlled products, are provided with **WHMIS training**
2. Training must be done whenever a new or changed controlled product is coming into the workplace, & WHMIS should be reviewed yearly
3. At a minimum, **WHMIS training must show and explain:**
 - the required information on labels and MSDS, and their importance
 - the employer's own workplace labels and labeling system
 - hazard symbols used on labels in the workplace
 - proper storage, handling, use and disposal of controlled products
 - proper use of required personal protective equipment
 - how to respond in an emergency involving a controlled product
 - product-specific training on health & safety hazards

WHMIS

**How can it protect me from
being injured at work?**



WHMIS and your key safety rights!

Your key rights under workplace health and safety law are:

- 1. The Right to Know**
- 2. The Right to Participate**
- 3. The Right to Refuse**

So for WHMIS this means:

1. You have the **right to know about the hazards of controlled products** in your workplace, and how to protect yourself
2. You have the **right to participate in WHMIS training, and to report** situations where WHMIS isn't being followed
3. If you have not been trained in safe use, handling & PPE for a controlled product, you have the **right to refuse to work with that product.**

Exercising Your Safety Rights = Protection!

Exercising your safety rights under WHMIS means you are working to protect yourself from workplace injury and illness.

- Take WHMIS training seriously
- Follow safe handling & correct PPE procedures
- Talk to supervisors if there are no WHMIS labels, MSDS, training or proper protective equipment
- If you haven't been trained for a product, don't handle it
- Understand how to exercise your right to refuse work.

WHMIS

Employer Responsibilities

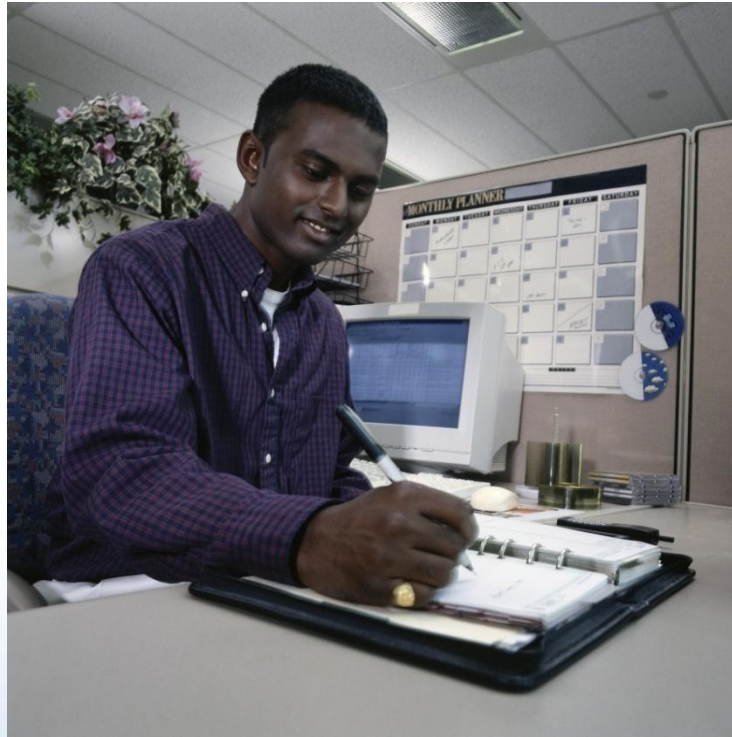


Employer WHMIS Responsibilities, they must:

- Make sure that each controlled product has an MSDS readily available to workers.
- Make sure that each controlled product has a supplier and/or workplace label that is legible and in good condition.
- Make sure employees working with, or around, controlled products are trained on the health & safety information for that product, including:
 - the content and purpose of WHMIS labels and MSDS's
 - safe use, storage, handling, & disposal of controlled products
 - emergency response to incidents with controlled products
 - the health & safety hazards of the controlled products.

WHMIS

Worker Responsibilities



Worker Role and Responsibility:

- Receive and **learn** the WHMIS information about controlled products that the employer provides.
- When using and/or around controlled products, **work in a safe and appropriate manner**, including the use of correct PPE and other hazard barrier measures.
- **Tell the employer** whenever you do not have enough information, correct PPE, or proper safe handling measures available to ensure your health and safety.
- Work and cooperate with the employer in the development, delivery and review of WHMIS training programs.

WHMIS: Where for more info?

St. John Ambulance Atlantic www.getlifesmart.ca

OHS Division: Labour & Advanced Education
www.gov.ns.ca/lae/healthandsafety

Health Canada www.hc-sc.gc.ca

WCB Nova Scotia
www.worksafeforlife.ca



Ideas for Classroom Activities

Use as introductory or completion exercise...

- What do you think a hazardous material is?
- What do you think hazardous materials could do to your body?
- How are you regularly exposed to hazardous materials? At work? At home? At school?
- Can you think of a material that may be hazardous, but isn't a "controlled product" under WHMIS?

Use close to the end of "Part 1: Labels"

- Take a look around your school, your home, the mall or the grocery store. Where do you find WHMIS class symbols? Which ones are the most common? On what kinds of things? In what kinds of settings?
- Design a new symbol for a product or a task (at work or at home) that you think could be or is hazardous. What is your new symbol and what does it look like?
- When WHMIS class symbols, or symbols for PPE are used, they're often on labels. To increase worker awareness and decrease the chance of an injury, where else could symbols be displayed? Draw a floor plan of a business to show where you would put them.

Use close to the end of "Part 1: Labels"

Workplace labels need to reach everyone!

Think about communicating with persons who don't read well, or whose first language isn't common in the workplace.

What should be considered when designing a workplace label that needs to 'speak' to all workers.

Design a workplace label that reflects literacy, language, or cultural differences. What does it look like?

Use close to the end or after of "Part 2: MSDS"

- There are controlled products in most schools, often places like tech shops, cleaning closets, cafeteria kitchens, etc. **Get permission** to enter one of these areas, find an MSDS for a product, and write down: what it is, what it's used for, the required or recommended PPE, preventive measures, and 1st Aid procedures. Report back to the class.
- Do a media search to find articles related to unsafe incidents involving chemicals and controlled products. Write one paragraph about which parts of an MSDS would help workers and emergency responders in those types of situations.
- Design an MSDS for workers who do not have English or French as a first language, or who don't read well. Decide which sections you can convert to "plain language" or can use symbols for, and design it!

Use after "Part 3: Worker Education & Training", and/or as a wrap-up to the whole unit

- You manage a small business and your employees are all 16-19 years old. Pick one controlled product that is used at your workplace, and design a WHMIS training program effective for your employees. What does it look like?
- In groups of 4-5, choose a workplace with at least three different departments or services. One person in the group is the employer, and the others all manage a department or service. As a group, design an overview of (1) what a general WHMIS training program would look like for all workers, and (2) what specific WHMIS training would be needed by the workers in the different departments.
- How do you like to learn? What ways suit you best? How could this be applied to learning about WHMIS?

*Use after "Part 3: Worker Education & Training",
and/or as a wrap-up to the whole unit*

Role Playing Scenarios

- Employer and Worker: the worker has to report (Worker gets to choose) an unsafe situation, but the employer doesn't want to hear it – how to handle?
- Worker and Worker: one worker is new, and on his/her first shift job shadowing the other for orientation; she/he notices that the other is taking frequent safety "shortcuts" (choose as part of the exercise) - how to handle?
- Supervisor and Worker: the supervisor and worker are practically the same age; the supervisor has to speak with the worker because she/he has not been following proper safe handling procedures for a controlled product – how to handle?