Workplace Hazardous Material Information System
Objectives

• Recognize the two hazard groups
  • Understand the 32 hazard classes as well as the categories, subcategories, and types associated with each hazard class
• Learn the pictograms and the information they convey
• Be able to identify and understand GHS labels
• Learn the components of Safety Data Sheets (SDS) and how to utilize them for information
What is WHMIS?

- WHMIS is a Canada wide hazard communication system developed to provide employers and workers information about hazardous products used in the workplace.

- WHMIS legislation is a combined effort between industry, and provincial and federal governments.

- Manitoba WHMIS requirements are set by the Workplace Safety and Health Regulations (Part 35).
Why was WHMIS created?

- WHMIS was created in 1988 as a response to a workers “right to know” about both the safety and health hazards associated with the chemicals or hazardous products they might use at work.

- WHMIS was also created to reduce injuries and illnesses associated with handling hazardous materials in the workplace.

- In February 2015, Canada aligned WHMIS with the Globally Harmonized System of Classification and Labelling of Chemicals.

- GHS has offered some changes to ‘WHMIS 1988” (mainly additional protection to workers).
WHMIS Components

WHMIS is composed of 3 main elements to communicate the information of chemicals or hazardous products:

1. Labels – affixed to containers of chemicals or hazardous products and provides information regarding the hazards

2. Safety Data Sheets (SDS) – provide supplementary information to hazards outlined on the labels

3. Education – education on how to use the information provided, and training on how to safely handle hazardous products
Health Effects

Potential Health Effects upon exposure to hazardous products

- Health effects may range from minor reversible effects to severe effects that are irreversible

Two types

Acute – these types of health effects happen quickly, usually shortly after exposure

Chronic - these types of health effects happen slowly over time
WHMIS Responsibilities

WHMIS is a shared responsibility amongst:

• Suppliers
• Employers
• Employees
Supplier Responsibilities

Supplier responsibilities include:

- Determining which products are “hazardous” products and classifying them appropriately under regulatory standards
- Establishing health and safety information regarding a product
- Labelling products with GHS (supplier) labels
- Preparing and providing SDS’s for customers
Employer Responsibilities

Employer responsibilities include:

- Ensure all hazardous products at their work site have Supplier or Workplace labels.
- Provide access to SDS’s of hazardous products to employees and update them as necessary.
- Educate workers on how to read and recognize supplier or workplace labels and SDS’s.
- Train workers on how to handle, use, and store hazardous products, and, if required, use personal protective equipment.
- Develop safe work procedures (SWPs).
- Prepare SDS’s and labels as needed.
Employee Responsibilities

Employee responsibilities include:

• Participating in education and training provided by the employer

• Following prescribed safe work procedures

• Identifying and controlling hazards
Routes of Entry

For chemicals or hazardous products to be of concern to a person’s health, there must be contact or entry into the body. In addition, the chemical or hazardous product must have a biological effect on the body.

There are four routes of entry:

• Inhalation
• Ingestion
• Absorption
• Injection
Routes of Entry

Inhalation

- Most common
- Dust, mist, fumes and vapors inhaled through the nose or mouth and make their way into the lungs
- When in the lungs, this is where damage may be caused and entry into the bloodstream
Routes of Entry

Ingestion

• Chemicals are absorbed easily through the digestive tract
• Transfer can happen if hazardous products are hands while eating
• Consumption or storage of uncovered foods in areas where risk of chemical or hazardous product exposure is also possible.
Routes of Entry

Absorption

- Chemicals or Hazardous Products may enter by passing through the skin.
- The severity or harm also depends on the type of chemical or hazardous product
- Some hazardous products may cause skin to become sensitive, while others may enter into the blood stream
Routes of Entry

Injection

- Sometimes chemicals can enter the body through existing cuts, punctures or syringe needles.
What is a Hazardous Product?

Hazardous products are materials, products, or substances that meet any of the criteria for one or more of the 32 GHS Hazard Classes as defined in the Federal Hazardous Products Regulation.

- Hazard classes grouped into Physical Hazards and Health Hazards
- Hazard classes contain categories, subcategories, or types
- WHMIS does not provide a comprehensive list of hazardous products, only a list of hazard criteria
Exclusions from WHMIS

The following are exempt from the supplier responsibilities of WHMIS (no label or SDS required):

• Consumer restricted products: products sold in stores that already have labels in accordance with the Canada Consumer Product Safety Act
• Explosives: covered by the Explosives Act
• Cosmetics, drug, food, or devices: covered by the Food and Drugs Act
• Pesticides, herbicides, and insecticides: covered by the Pest Control Products Act

*If another Act exists, WHMIS may not be applicable*
Exclusions from WHMIS

The following are exempt from the supplier responsibilities of WHMIS (no label or SDS required):

- Radioactive materials: covered by the Nuclear Safety and Control Act
- Wood and wood products
- Manufactured articles that will not release chemicals
- Tobacco or tobacco products
- In-house generated hazardous waste
- Hazardous materials transported under the Transportation of Dangerous Goods act (TDG)

**Employer still responsible for training employees on the safe use, handling, and storage of these materials**
# Hazard Groups and Classes

**Physical Hazards Group**: based on physical and chemical properties of a given product

<table>
<thead>
<tr>
<th>Physical Hazard Classes</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gases</td>
<td>Flammable aerosols</td>
<td>Oxidizing gases</td>
</tr>
<tr>
<td>Gases under pressure</td>
<td>Flammable liquids</td>
<td>Flammable solids</td>
</tr>
<tr>
<td>Self-reactive substances and mixtures</td>
<td>Pyrophoric liquids</td>
<td>Pyrophoric solids</td>
</tr>
<tr>
<td>Self-heating substances and mixtures</td>
<td>Substances in mixtures which, in contact with water, emit flammable gases</td>
<td>Oxidizing liquids</td>
</tr>
<tr>
<td>Oxidizing solids</td>
<td>Organic peroxides</td>
<td>Corrosive to metals</td>
</tr>
<tr>
<td>Combustible dusts</td>
<td>Simple asphyxiates</td>
<td>Pyrophoric gases</td>
</tr>
<tr>
<td>Physical hazards not otherwise classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hazard Groups and Classes

Health Hazards Group: based on a product's ability to result in a health-related issue

<table>
<thead>
<tr>
<th>Health Hazard Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
</tr>
<tr>
<td>Carcinogenicity</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
</tr>
<tr>
<td>Specific target organ toxicity — single exposure</td>
</tr>
<tr>
<td>Specific target organ toxicity — repeated exposure</td>
</tr>
<tr>
<td>Aspiration hazard</td>
</tr>
<tr>
<td>Biohazardous infectious materials</td>
</tr>
<tr>
<td>Health hazards not otherwise classified</td>
</tr>
</tbody>
</table>
Hazard Groups and Classes

Environmental Hazards Group: based on a product’s ability to be harmful to the environment

- Group and classes not adopted in the Hazardous Products Regulations

- Suppliers outside of Canada may still provide this information on:
  - Labels
  - SDSs
Hazard Categories

All hazard classes have at least one hazard category

- Categories are assigned a number (e.g. 1, 2, 3)
  - Subcategories (e.g. 1A, 1B, 1C)
- Categories can also be referred to as types (e.g. A, B, C)

The lower the category number, the higher the hazard

Category 1 Category 2 Category 3

High hazard 1A 1B 1C

Low hazard
# Physical Hazard Class Descriptions

<table>
<thead>
<tr>
<th>Hazard Class(es)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gases; Flammable aerosols; Flammable liquids; Flammable solids</td>
<td>Products can readily ignite, creating hazard for fire or explosion</td>
</tr>
<tr>
<td>Oxidizing gases; Oxidizing liquids; Oxidizing solids</td>
<td>Oxidizers that can cause a fire or explosion or intensify a fire</td>
</tr>
<tr>
<td>Gases under pressure</td>
<td>Gases under high pressure in a cylinder or container that have potential to explode and cryogenics that can cause severe burns</td>
</tr>
<tr>
<td>Self-reactive substances and mixtures</td>
<td>Products which may react to create a fire or explosion, or upon heating cause a fire or explosion</td>
</tr>
<tr>
<td>Pyrophoric liquids; Pyrophoric solids; Pyrophoric gases</td>
<td>Products that ignite spontaneously in the presence of air</td>
</tr>
<tr>
<td>Self-heating substances and mixtures</td>
<td>Products that can ignite in the presence of air after a duration of time</td>
</tr>
<tr>
<td>Hazard Class(es)</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Substances and mixtures which, in contact with water, emit flammable gases</td>
<td>Products that react with water to release a flammable gas</td>
</tr>
<tr>
<td>Organic peroxides</td>
<td>Upon heating, products that can cause a fire or explosion</td>
</tr>
<tr>
<td>Corrosive to metals</td>
<td>Products that are corrosive to metals</td>
</tr>
<tr>
<td>Combustible dust</td>
<td>Finely divided particles that, if in air, can catch fire or explode upon ignition</td>
</tr>
<tr>
<td>Simple asphyxiates</td>
<td>Gases that displace air, causing suffocation</td>
</tr>
<tr>
<td>Physical hazards not otherwise classified</td>
<td>Products that, based off of their physical and chemical properties, can result in serious injury or death of a person</td>
</tr>
</tbody>
</table>
## Health Hazard Class Descriptions

<table>
<thead>
<tr>
<th>Hazard Class(es)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Products that are fatal, toxic, or harmful if they come in contact with the skin, are inhaled, or swallowed</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Products that can cause severe skin burns or irritations</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Products that can cause severe eye damage or irritations</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Product that may cause asthma or allergy like symptoms or difficulty breathing</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Products that may cause or are suspected to cause genetic defects</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Products that may cause or are suspected to cause cancer</td>
</tr>
</tbody>
</table>
## Health Hazard Class Descriptions Cont.

<table>
<thead>
<tr>
<th>Hazard Class(es)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive toxicity</td>
<td>Products that may cause damage or are suspected to damage one's fertility or an unborn baby</td>
</tr>
<tr>
<td>Specific target organ toxicity – single exposure</td>
<td>Products that can cause damage to organs following a single exposure</td>
</tr>
<tr>
<td>Specific target organ toxicity – repeated exposure</td>
<td>Products that can cause damage to organs following prolonged or repeated exposures</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Products that are fatal if swallowed or inhaled</td>
</tr>
<tr>
<td>Biohazardous infectious materials</td>
<td>Biohazardous materials (microorganisms, nucleic acids, proteins) that can cause infection, with or without toxicity, in humans and animals</td>
</tr>
<tr>
<td>Health hazards not otherwise classified</td>
<td>Products that may cause health hazards following single or repeated exposures, including risk of injury or death</td>
</tr>
</tbody>
</table>
WHMIS Pictograms

Pictogram

- Graphic image
  - Fast hazard assessment
  - Labels and SDSs

- Red square on one point

- Symbol in the middle

- Represent hazard classes and categories
  - Can represent multiple hazard classes/categories
WHMIS Pictograms

- Corrosion
- Flame over circle
- Exclamation mark
- Gas cylinder
- Exploding bomb
- Health hazard
- Flame
- Skull & crossbones
WHMIS Pictograms

• Unique to Canada
  • Biohazardous infectious materials

• Not being implemented in Canada
  • Environment

• May still appear on:
  • Labels
  • SDS
## Corrosion

<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CORROSION</strong></td>
<td>The material causes severe eye and skin damage. May cause metal containers or structural materials to become weak and eventually to leak or collapse.</td>
<td>Avoid skin or eye contact. Use proper protective equipment. Wash immediately on contact. Store in designated areas.</td>
</tr>
<tr>
<td><em>(Health &amp; Physical Hazard)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Corrosive to metals
- Skin corrosion
- Serious eye damage
# Health Hazard

<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description:</th>
<th>Precautions:</th>
</tr>
</thead>
</table>
| **Health Hazard** | - The material may be a skin or eye irritant.  
- May cause allergic skin reaction (skin sensitizer)  
- The material has the potential to cause adverse health effects such as cancer, birth defects and respiratory sensitization. | - Handle with care.  
- Avoid contact, use proper protective equipment.  
- Use in well-ventilated area.  
- Wash immediately on contact.  
- Store in designated area. |

- Carcinogenicity
- Respiratory Sensitization
- Reproductive Toxicity
- Aspiration Hazard
- Target organ toxicity – single or repeated exposure
# Exploding Bomb

<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exploding Bomb</strong>&lt;br&gt;<em>(Physical Hazard)</em></td>
<td>• The material is unstable&lt;br&gt;• It undergoes vigorous chemical reactions&lt;br&gt;• Shock, pressure or temperature changes may start chemical reactions</td>
<td>• Keep away from heat&lt;br&gt;• Do not shake&lt;br&gt;• open carefully&lt;br&gt;• Require careful storage and handling&lt;br&gt;• Store in a designated area</td>
</tr>
</tbody>
</table>

- Self-reactive substances and mixtures *(severe)*
- Organic peroxides *(severe)*
<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame (Physical Hazard)</td>
<td>• The material is a fire hazard.</td>
<td>• Keep away from heat sources.</td>
</tr>
<tr>
<td>• Flammables (gases, liquid, solids, aerosols)</td>
<td>• It may burn at low temperature.</td>
<td>• Never smoke near it.</td>
</tr>
<tr>
<td>• Self-Reactive substances</td>
<td>• Sparks, flame or friction could ignite it.</td>
<td>• Store in a designated area.</td>
</tr>
<tr>
<td>• Pyrophoric (gases, liquid, solids)</td>
<td>• May burst into flame spontaneously.</td>
<td>• Keep away from oxidizers.</td>
</tr>
<tr>
<td>• Self-Heating substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Contact with water, emits flammable gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Organic Peroxides</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Flame Over Circle

<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
</table>
| Flame over Circle (Physical Hazard) | • Increase the risk or intensity of a fire by providing available oxygen.  
• The material is a fire or explosion risk near flammable or combustible material.  
• May burn skin or eyes on contact. | • Keep away from sources of ignition.  
• Wear eye or face shields, gloves or other protective clothing as required.  
• Keep away from flammable & combustible material |
<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
</table>
| **Gas Cylinder (Physical Hazard)** | • It is a gas under pressure.  
• Heat may cause it to explode.  
• A drop or impact may cause it to explode.  
• Sudden release of contents could injure the skin or eyes. | • Handle with care.  
• Store in a designated area.  
• Keep away from heat. |
## Skull and Crossbones

<table>
<thead>
<tr>
<th>WHMIS Pictogram</th>
<th>Description</th>
<th>Precautions</th>
</tr>
</thead>
</table>
| **Skull**  
  *(Health Hazard)* | • The material is poisonous and may have immediate and serious effects.  
• Can cause rapid or serious injury or death, even in small amounts.  
• It can be fatal if inhaled, ingested or absorbed.  
• It may affect the eyes. | • Handle with care.  
• Avoid contact, use proper protective equipment.  
• Use in well-ventilated area.  
• Wash immediately on contact.  
• Store in designated area. |
# Biohazardous Infectious Material

## WHMIS Pictogram

<table>
<thead>
<tr>
<th>Biohazardous Infectious Material (Health Hazard)</th>
</tr>
</thead>
</table>

## Description

- The material may cause disease
- The material may contain poisonous toxins

## Precautions

- Handle with care – avoid contamination
- Use in designate areas
- Use protective equipment
WHMIS Labels

- Suppliers and employers are both responsible for ensuring labels are affixed to hazardous products.
- Delivery of a hazardous product may be refused if a supplier label is not affixed to it.
- Labels provide information for hazardous products, such as:
  - Identification
  - Hazards associated with handling the product
  - Precautions to when taken when handling the product
- Two types of labels:
  - Suppliers Labels
  - Workplace Labels
Supplier Labels

Product Identifier

Signal Word

Precautionary Statement

Product K1 / Produit K1

Pictogram

Danger

Fatal if swallowed.
Causes skin irritation.

Precautions:
Wear protective gloves.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.

Store locked up.
Dispose of container/container in accordance with local regulations.

IF ON SKIN: Wash with plenty of water.
If skin irritation occurs: Get medical advice or attention.
Take off contaminated clothing and wash it before reuse.

IF SWALLOWED: Immediately call a POISON CENTRE or doctor.
Rinse mouth.

Compagnie XYZ, 123 rue Machin St, Mytown, ON, NON 0N0 (123) 456-7890

Hazard Statement

Danger

Mortel en cas d’ingestion.
Provoque une irritation cutanée.

Conseils :
Porter des gants de protection.
Se laver les mains soigneusement après manipulation.
Ne pas manger, boire ou fumer en manipulant ce produit.

Garder sous clé.
Éliminer le contenant/recipient conformément aux réglements locaux en vigueur.

EN CAS DE CONTACT AVEC LA PEAU : Laver abondamment à l’eau.
En cas d’irritation cutanée : Demander un avis médical/consultez un médecin.
Enlever les vêtements contaminés et les laver avant reutilisation.
EN CAS D’INGESTION : Appeler immédiatement un CENTRE ANTIDOTE ou un médecin.
Rinser la bouche.

Supplier Identification
# Supplier Labels

<table>
<thead>
<tr>
<th><strong>Product Identifier</strong></th>
<th>Name exactly as it appears on the container and SDS</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Hazard Pictograms</strong></th>
<th>Are determined by the hazard class.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Signal Word</strong></th>
<th>“Danger” or “Warning” used to emphasize hazards and their severity</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Hazard Statements</strong></th>
<th>Brief standardized statements of all hazards based on the WHMIS 2015 hazard classification of the product</th>
</tr>
</thead>
</table>
Supplier Labels

**Precautionary Statements** — standardized phrases that describe measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper handling or storage of a hazardous product. Includes protective equipment, emergency measures, first aid

**Supplier Identifier** - The company which made or packaged the product, and is responsible for the label and SDS/MSDS information.

The supplier label must be bilingual (English/French), easy to read, and durable. If the label is lost, damaged, or no longer readable, the product must re-labelled

The pictogram(s), signal word and hazard statement(s) must be grouped together on a label.
Workplace Labels

WHMIS workplace labels are required when:

• A product is poured from its original container into a new one

• A bulk shipment arrives without a supplier label

• A hazardous material is produced on site and placed in a container
Workplace Labels

The following is required to appear on workplace labels

- Product name
  - Must match the product name listed on the SDS

- Safe handling precautions
  - May include pictograms and other supplier label information

- Reference to the SDS
Workplace Labels

Product Name

[Hazard (s)]

- Flammable
- Oxidizer
- Toxic/poisonous
- Corrosive
- pH:
- Reactive/explosive
- Sensitizer/allergen

Safe Handling /Personal Protection

- No inhalation
- No ingestion
- No skin/eye contact
- No chronic exposure

Name: __________________________________________
Dept.: _________________________________________

Phone #: __________________
Date: _______________________

Refer to Safety Data Sheets for more info
# Safety Data Sheets

<table>
<thead>
<tr>
<th>Have 16 section format</th>
</tr>
</thead>
</table>

| Standardized content requirements |
Must be accurate at point of sale |
Must be current – Has no Expiry date |

Updated when the supplier becomes aware of any "significant new data" *

| Available in French and English |
Must be readily accessible in the workplace |
Safety Data Sheets

Section 1: Identification
- Product identifier, recommended use and restrictions on use, supplier contact information, emergency phone number

Section 2: Hazard Identification
- Classification (hazard class and category) label elements (including pictogram, signal word, hazard statement and precautionary statements) and other hazards

Section 3: Composition /Ingredients
- Chemical name, synonyms, CAS No., hazardous ingredients that contribute to the classification of a product and associated health hazards.
Safety Data Sheets

Section 4: First-aid measures
• Provides the first-aid measures to take by route of exposure as well as most important symptoms/effects.

Section 5: Fire-fighting measures
• Provides information to assist with fire and explosion prevent and procedures in the event of emergency. Includes suitable (and unsuitable) extinguishing media, specific hazards, special equipment and precautions for fire fighters.
Safety Data Sheets

Section 6: Accident release measures
• Provides information on handling accidental spills and leaks. Includes information on protective equipment, emergency procedures, methods and materials for spill containment and clean up.

Section 7: Handling and Storage
• Provides information on precautions for safe handling and conditions for storage including incompatibilities.
Safety Data Sheets

**Section 8: Exposure controls/personal protection**
- Provides information on measures to prevent workers from being overexposed includes exposure limits, engineering controls, personal protective equipment.

**Section 9: Physical and chemical Properties**
- Provides a physical description of the product that is useful for recognition of its presence and understanding of its response to changes in the physical environment.
Safety Data Sheets

Section 10: Stability and reactivity
• Provides information on the stability of the product and its likelihood of dangerous reaction with other chemicals. Included are chemical stability, conditions of instability, incompatible substances. Reactivity and conditions or reactivity and hazardous decomposition products.

Section 11: Toxicological information
• Provides information on how the material is likely to enter the body - (known as routes of entry) and what short term, long term and multiple health effects are possible if the worker is overexposed. Includes the effects of acute and chronic exposure, carcinogenicity, reproductive effects, and respiratory sensitization.
Safety Data Sheets

Section 12: Ecological information
• Provides information on how the material is likely to affect the environment. Included are: aquatic and terrestrial toxicity (if available), persistence and degradability, bio-accumulative potential, mobility in soil.

Section 13: Disposal Considerations
• Provides information on how to safely dispose of the material. Included are: methods for safe handling of waste and disposal methods, including contaminated packaging.

Section 14: Transport information
• Provides information needed for the transportation of dangerous goods. Included are: UN number, proper shipping name, hazard classes and packing group.
Safety Data Sheets

**Section 15: Regulatory Information**
- Contains information on safety, health and environmental regulations specific to the product.

**Section 16: Other Information**
- Other information including the date of the latest revision of the SDS.
Lab Specific Training

In addition to the general education requirements under WHMIS legislation, it is wise to have lab specific training

- Items of to be include in this training may include but not limited to the following:

  - Safe Work Procedures
  - Emergency Spill procedures
  - Handling and use procedures
  - Personal Protective Equipment
Safety Controls

Controls are put in place to help minimize or eliminate exposure to hazards. This is achieved in the following (decreasing) order of effectiveness

- Elimination/Substitution
- Engineering Controls
- Administrative Controls
- Personal Protective Equipment
# Protective Measures

<table>
<thead>
<tr>
<th>Elimination or Substitution</th>
<th>Engineering Controls</th>
<th>Administration Controls</th>
<th>PPE (Personal Protective Equipment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a process that uses a hazardous product can be eliminated entirely, then the hazard will effectively no longer exist.</td>
<td>Engineering controls are used to remove a hazard or place a &quot;barrier&quot; between the worker and the hazard.</td>
<td>Administrative Controls include work practices, policies, procedures, training and other guidelines that individuals must follow.</td>
<td>Personal protective equipment (PPE) can be considered a “last line of defense” in protecting oneself from the hazards associated chemicals or hazardous products.</td>
</tr>
<tr>
<td>Substitutions can also mitigate the hazard entirely, if so, the control is equally as effective as elimination.</td>
<td>Engineered ventilation systems can provide exceptional protection from certain chemical exposure.</td>
<td>While these may be less effective than eliminating the hazard altogether, they are an extremely important element in reducing the likelihood of an incident occurring.</td>
<td>PPE includes important items such as safety glasses, respirators and gloves.</td>
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<td>Personal Protective Equipment should fit properly, be maintained regularly, and all employees should be trained in its proper storage, maintenance and use.</td>
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