

WHMIS Training

Workplace **H**azardous **M**aterial **I**nformation
System

**You MUST pass with >70% on the test in
order to continue in this course!**



Purpose of WHMIS

- The purpose of WHMIS is to inform/educate the worker of the hazards (DANGER) to him/herself in the workplace.
 - This is done by providing information about:
 - Safe storage
 - Safe handling
 - How to treat exposures
 - PPE requirements
 - What part of your body is most at risk
 - Labelling of critical information

WHMIS History

- Federal, provincial and industry partners worked together to create legislation on how to label, handle, and inform workers of hazardous materials.
- This legislation is found in all provinces and territories, with some variations between them.
- Created on Oct.31, 1989
- In the US, it's called the "RIGHT TO KNOW" legislation

Why you must learn this

- Know your rights and obligations
 - **Responsibilities and rights of Workers and Supervisors under the Occupational Health and Safety Act.**
 - **Overview of the Department's Safety Policies with respect to the application of the Act.**
- Know how to identify hazards
- Know how to protect yourself from hazards
- Know how to act about hazards
- Know how to get help

Why is WHMIS IMPORTANT

Many people have been killed or seriously injured as a result of exposure to hazardous materials. Some examples are:

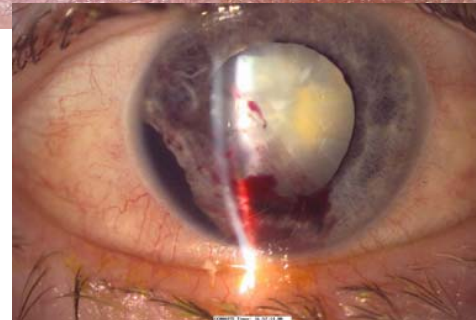
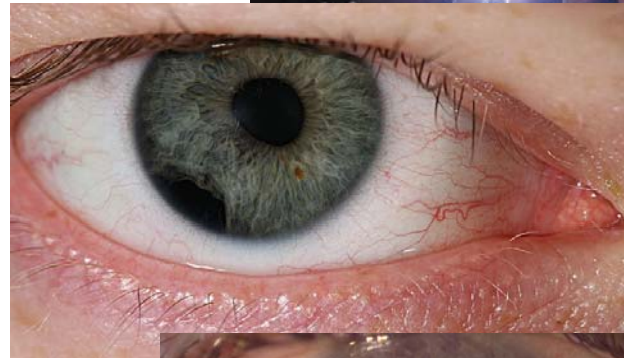
- Mark Smith
 - An NZ sheep farmer accidentally drank a selenium solution that damaged his internal organs.
 - Later while spraying pesticides, Mark used a respirator with the wrong cartridges and damaged his lungs .
- Sean Kells
 - As a 19-year old student, Sean was working at a factory pouring flammable materials from one container to another. A spark set off an explosion and Sean was burned to 90% of his body. He died the following day.

Why is WHMIS so important?

Lets look at a few organs that are especially prone to exposures.

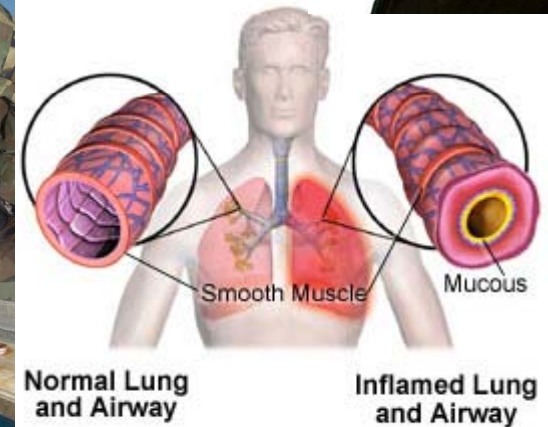
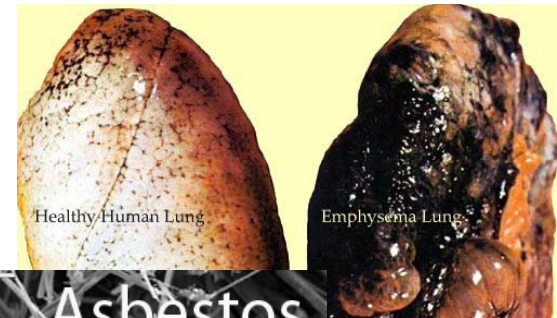
Eye Damage Sources

- Eyes
 - Chemical Exposure
 - Light Exposure (inc. lasers)
 - Mechanical Damage
 - Biological Exposure (Hep-A, B&C, HIV, Pink-eye)
- Always wear eye protection!!



Lung Damage Sources

- Lungs
 - Chemical Exposure
 - Dust/Particulate Exposure
(Metals, fibres, diesel particulate material)
 - Biological Exposure (moulds etc.)



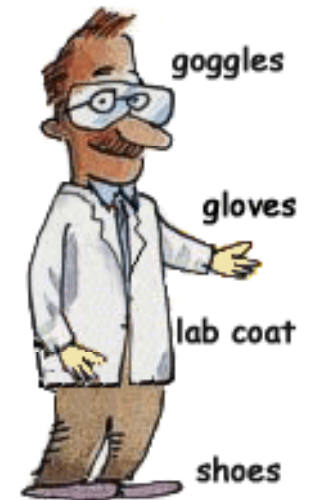
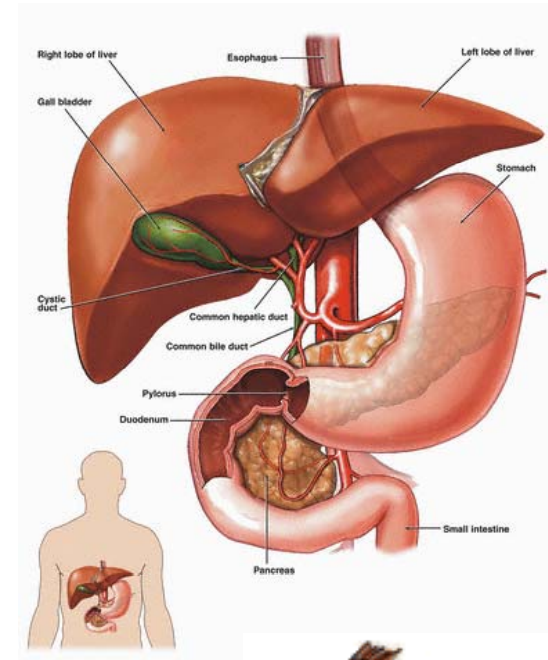
- Always wear PROPER type of masks when working with air born hazards.

Liver Damage Sources

- Liver
 - Chemical Exposure
 - Can be medical
 - Smoke inhalation
 - Liquid forms (Splash exposure)
 - Some chemicals are absorbed through the skin. Some VERY quickly.

- **Your liver is a FILTER.**

- Always use proper Personal Protection Equipment (PPE)



Reproductive Organ Damage Sources

- Chemical Exposure

- The state of California is a leader in publicising the list of exposures that cause reproductive toxicities.

- Ex: *Chromium (hexavalent compounds)*

- A full list of chemicals that can cause reproductive organ damage can be found here:

http://www.oehha.ca.gov/prop65/prop65_list/files/P65single121908.pdf

- Radio Active Exposures

- When pregnant, you are **ESPECIALLY** prone to contaminate the fetus if exposed to most chemicals.

- Always use proper Personal Protection Equipment (PPE)



Fetal Alcohol Syndrome

Limb Damage Sources

- Chemical Exposure
 - Acids, basis, corrosive agents, etc..
 - Can be powder, metals, fibres, etc..
 - Reactive agents can burn
 - Flammable Damage
 - Electrical Damage
 - Mechanical Damage
 - Radio Active Exposures
-
- Always use proper
Personal Protection Equipment (PPE)



WHMIS -EFFECTS

Hazardous materials are those that can they can have harmful effects on the human body.
These effects can be:

Acute

Acute effects are those that are felt immediately after a large exposure to a hazardous material

Chronic

Chronic effects are those that are felt after a long-term exposure to low levels of a hazardous material

Latency Period

The latency period is the time between exposure and when the harmful effects are felt.
The latency period could be months or years

WHMIS -ROUTES OF ENTRY

Hazardous materials can enter the body in a number of ways. These "**routes of entry**" are:

Inhalation

Through the nose or mouth

Examples are fumes or vapours breathed in

Ingestion

Through the mouth

Examples are materials accidentally eaten or drunk

Absorption

Through the skin

Examples are solvents used to wash hands

Injection

Direct penetration of the skin

Examples are needles and slivers

How WHMIS Works:

- WHMIS applies to hazardous materials known as controlled products.
- The supplier of the hazardous material provides the labels and MSDS (Material Safety Data Sheets) of the hazard to the employer.
- The employer passes this information to the worker AND provides education to ensure the worker is informed about the WHMIS process.

Who does WHMIS apply to?

- In Ontario, WHMIS applies to all workplaces covered by the *Occupational Health and Safety Act*, and to all federal government workplaces.
- Ex:
 - Construction work site
 - Labs
 - Schools
 - Research institutions
 - Etc..



YOU!

Who enforces WHMIS?

- In Ontario, both the federal and provincial WHMIS legislation is enforced by provincial Ministry of Labour inspectors, except in federal government workplaces, where Labour Canada inspectors enforce the legislation.

Federal WHMIS Legislation

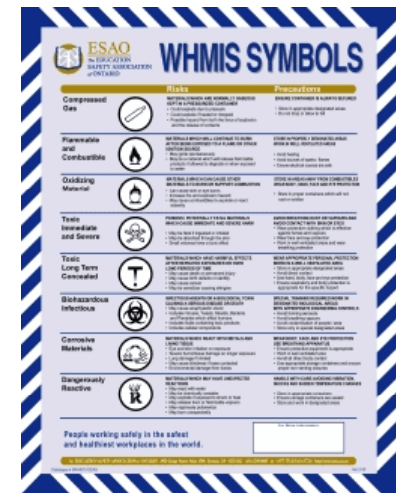
- 1) The Hazardous Products Act
 - Places responsibility to the supply to provide labels and MSDS sheets.
- 2) The Controlled Products Regulation, passed on January 20, 1988
 - Defines what is a controlled product
- 3) The [Ingredient Disclosure List](#), issued on January 20, 1988
 - List of ingredients used in a product, and concentration used.
- 4) The Hazardous Materials Information Review Act, passed on June 30, 1987
 - Establishes the Hazardous Materials Information Review Commission
 - Federal agency that will rule on claims for exemption from disclosing confidential business information
 - Specifies what information the supply can withhold from the MSDS.
- 5) The Hazardous Materials Information Review Regulations passed on January 20, 1988
 - This regulation sets out the criteria that the Commission will use when assessing the validity of a claim for exemption, and also sets out the fees to be paid when filing a claim for exemption, or appealing a decision of the Commission.

Ontario WHMIS Legislation

- 1) The *Occupational Health and Safety Act*
 - Places duties on employers where hazardous materials are used, to obtain labels and MSDS sheets from their suppliers.
 - Provide worker education programs.
- 2) The WHMIS Regulation, Ontario Regulation 644/88, which came into effect on October 31, 1988
 - Describes in detail the employer duties respecting labels, material safety data sheets and worker education.

WHMIS

- Three things are required:
 - Proper Labelling
 - Proper MSDS Data Sheets
 - Proper Education
- **You cannot handle, use, store or transport hazardous materials in industry/school unless you meet these three requirements.**



Responsibilities of the supplier

- 1) Determine which product, intended for use in the work place, contains hazardous materials and are controlled products. “Classification Step”
- 2) To label all controlled products sold or imported.
- 3) Provide MSDS sheets for each product that contain controlled products.

What are Controlled Products?

- There are 6 Classes listed under the Act:
 - (CLASS-A) Compressed Gas
 - (CLASS-B) Flammable and Combustible materials
 - (CLASS-C) Oxidizing materials
 - (CLASS-D) Poisonous and Infectious materials
 - (CLASS-E) Corrosive materials
 - (CLASS-F) Dangerously reactive materials



Compressed Gas (Class A)



- A compressed gas is a gas at room temperature (20C) and pressurized into a pressurized container/cylinder.
- It also includes gases placed in liquid form by compression or refrigeration.
- The potential hazard of compressed gases occurs when sudden rupturing of the container causes it to become a dangerous projectile.
- Examples:
 - Propane, welding tanks: Oxygen & Acetylene, scuba diving tanks: air, paint ball tanks (CO₂ or Air), WD40 and other aerosols cans.

(Class B) Flammable & Combustible



- Class B Flammable and Combustible Material
 - Division 1 Flammable Gases
 - Division 2 Flammable Liquids
 - Division 3 Combustible Liquids
 - Division 4 Flammable Solids
 - Division 5 Flammable Aerosols
 - Division 6 Reactive Flammable Materials

(Class B) Flammable & Combustible



- Flammable or combustible materials will ignite and continue to burn if exposed to a flame or source of ignition.
- Materials are classified as a flammable gas, flammable aerosol, flammable liquid, combustible liquid, flammable solid, or reactive flammable material.
- Examples:
 - Oils, Gasoline, Kerosene, WD40, and Alcohol based products.

Oxidizing

(Class C)



- Oxidizing material may or may not burn itself, but will release oxygen or another oxidizing substance, and thereby causes or contributes to the combustion of another material.
- Oxidizing material has to be stored in special containers and must be transported with extreme care.
- Examples:
 - Ozone, Chlorine, and Nitrogen Dioxide (N₂O) are oxidizing materials which support a fire and are highly reactive.

(Class D)

Class D - Poisonous and Infectious Material

- This class is divided into three (3) subdivisions:
 - Division 1 Material Causing Immediate and Serious Toxic Effects
 - Subdivision A Very Toxic Material
 - Subdivision B Toxic Material
 - Division 2 Materials Causing Other Toxic Effects
 - Subdivision A Very Toxic Material
 - Subdivision B Toxic Material
 - Division 3 Biohazardous Infectious Material

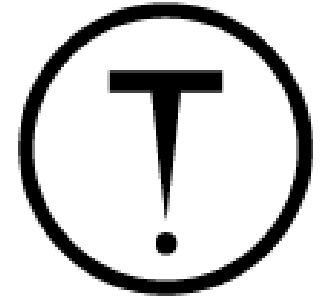
Poisonous (Class D1)



- Materials causing immediate and serious toxic effect to the human body.
- It is found on materials that are toxic when ingested
- These materials may be classified as toxic or very toxic.
- This symbol is the most common found symbol in homes
- Examples:
 - Bleach, Mr. Clean, Tide, Cyanide and rat poisoning are very toxic. Arsenic (green pressure treated wood)
 - All chemicals in the Workshop lab are poisonous!!!

Toxic

(Class D2)



- A pure substance or mixture that may be any one of the following: a carcinogen, a teratogen, a reproductive toxin, a respiratory tract sensitizer, an irritant or a chronic toxic hazard.
- Chemicals that fit into this category **cause slower** effects to the body.
- Examples:
 - Asbestos, Arsenic and Nicotine are toxic substances.
 - Gasoline, hydrocarbons

BIOHAZARD

(Class D3)



- This classification includes any organisms and the toxins produced by these organisms that have been shown to cause disease, or are believed to cause disease in either humans or animals. These hazards are often found in hospitals and on products and materials that are harmful, such as viruses or bacteria.
- Examples:
 - Blood sample containing the Hepatitis B Virus is a biohazardous infectious material because it may cause hepatitis in people exposed to it
 - Ebola and Flesh-eating disease are also biohazardous
 - Anthrax

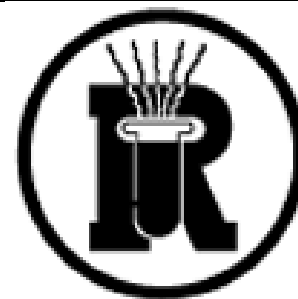
Corrosive

(Class E)



- This symbol is the 2nd most common symbol found in homes across North America. It is found on products which *corrode (eat away)* metals or cause permanent damage to human tissues such as the skin and eyes on contact by burning, scarring or blinding.
- Corrosive materials may also cause metal containers or structural materials to become weak, leak or collapse.
- Examples:
 - Bleach, Battery Acid, Ammonia, Hydrochloric Acid
 - Developer, Ferric Chloride, Ammonium Chloride, Merchloric Activator, any Etchant!
 - BASES and ACIDS

(Class F) Dangerously Reactive



- Certain chemicals when mixed, undergo vigorous reactions and can produce harmful side effects.
- They may react violently (**explode**) under conditions of shock, or when there is an increase in pressure or temperature.
- They may also react vigorously with water to release a toxic gas.
- Examples:
 - Chemicals that should not be mixed are bleach, drain cleaner, and ammonia because, when combined, they form a toxic gas.
 - Nitroglycerine

Supplier WHMIS Label

- Requires 7 things:
 - 1) *The name of the product*
 - *Can be a chemical name, common name, or trade name*
 - 2) *The name of the supplier*
 - 3) *A reference to a MSDS stating to get more information*
 - 4) *Hazardous Symbol(s)*
 - 5) *Risk Phrases*
 - *Ex: eye irritant, causes severe burns, rapidly absorbed through the skin, etc.*
 - 6) *Precautionary Measures*
 - *Short statement: avoid contact with skin, wear face protection, store away from heat, etc.*
 - 7) *First Aid Measure (Immediate measures, not medical procedures)*

Supplier WHMIS Label DESIGN Requirements

- 1) Language: Must be in English and French
- 2) Border: Must be slanted hatch, any colour, as long as it contrasts the container.
- 3) Layout: As long as all the information is present, the layout is left to the supplier.
- 4) Colour: Colour must contrast the container.
- Notes: Size does not matter.

Supplier Label

METHANOL

**DANGER
POISON
FLAMMABLE
VAPOUR HARMFUL
MAY CAUSE BLINDNESS IF
SWALLOWED**

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.

FIRST AID: In case of contact, immediately, flush eyes and skin with plenty of water for at least 15 minutes.

If swallowed, induce vomiting by sticking finger down throat, or by giving soapy water to drink. Repeat until vomit is clear.

If affected by vapour, move to fresh air.

If breathing has stopped, apply artificial respiration.

**GET MEDICAL ATTENTION
IMMEDIATELY.**

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.



METHANOL

**DANGER
POISON
INFLAMMABLE
VAPEURS NOCIVES
PEUT PROVOQUER LA CÉCITÉ, SI
AVALÉ**

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.

PREMIERS SOINS: En cas de contact avec les yeux ou la peau, laver à grande eau pendant au moins 15 minutes.

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.

Sortir au grand air, si indisposé par les vapeurs.

Si la respiration est interrompue, recourir à la respiration artificielle.

OBTENIR DES SOINS MÉDICAUX IMMÉDIATS.

PRÉCAUTIONS: Porter des lunettes protectrices (pour produits chimiques) et des gants 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.

SEE MATERIAL SAFETY DATA SHEET FOR PRODUCT
VOIR FICHE SIGNALÉTIQUE

ABC Company
Anytown, Ontario Telephone 123-4567

Supplier's Label

TOLUENE SULPHONIC ACID 70%, LIQUID ACIDE SULFONIQUE TOLUÈNE À 70%, LIQUIDE

RISK PHRASE(S)

Highly irritating to skin, eyes and nose.

HEALTH HAZARD DATA:

Strong Acid: Treat as per sulphuric acid.

EFFECTS OF OVEREXPOSURE: ACUTE

OVEREXPOSURE: Skin and eye.

PRECAUTIONARY MEASURES

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

EYE: Face shield and goggles.

GLOVES: Rubber.

OTHER CLOTHING AND EQUIPMENT: Rubber apron, rubber boots.

FIRST AID MEASURES:

EYES: Flush with copious quantities of water for 15 minutes. Consult physician.

SKIN: Flush with water as per sulphuric acid.

INGESTION: Treat as per sulphuric acid. Consult physician.



RISQUE(S) POSSIBLE(S)

Extrêmement irritant pour la peau, les yeux et le nez.

RENSEIGNEMENTS SUR LES DANGERS POUR LA SANTÉ

Acide fort: Traiter comme pour l'acide sulfurique.

EFFETS D'UNE SUREXPOSITION

SUREXPOSITION AIGUË: Peau et yeux.

MESURES DE PRÉCAUTION

ÉQUIPEMENT DE PROTECTION SPÉCIFIQUE:

YEUX: Écran facial et lunettes

GANTS: En caoutchouc.

AUTRES VÊTEMENTS ET ÉQUIPEMENT: Tablier en caoutchouc; bottes en caoutchouc.

PREMIERS SOINS:

YEUX: Bien rincer à grande eau pendant 15 minutes. Consulter un médecin.

PEAU: Rincer à l'eau comme pour l'acide sulfurique.

INGESTION: Traiter comme pour l'acide sulfurique. Consulter un médecin.

**REFER TO MATERIAL SAFETY DATA SHEET FOR FURTHER INFORMATION
POUR PLUS D'INFORMATIONS, CONSULTER LA FICHE SIGNALÉTIQUE**

Henkel Canada Ltd.

162 Ward Ave., Hamilton, Ontario L8N 3M8

(416)525-4660

MSDS – Material Safety Data Sheet

- Is a technical document that summarizes the health and safety of information available about the controlled product. It supplements the WHMIS label.
- Note: The MSDS is not intended to provide ALL information about the product or how to safely use it under all conditions. The employer, through education to their employees, are expected to supply information about how to safely handle the product for their specific application.

MSDS – Information Required

Their must be at least nine (9) sections to a MSDS sheet.

- 1) Product Information
- 2) Hazardous Ingredients
- 3) Physical Data
- 4) Fire or Explosion Hazard
- 5) Reactivity Data
- 6) Toxicological Properties
- 7) Preventive Measures
- 8) First Aid Measures
- 9) Preparation Information

MSDS – Information Required

- 1) Product Information
 - To identify the product
 - To identify the supplier/manufacturer
 - To describe the general use of the product
- 2) Hazardous ingredients
 - Information about the names of the controlled ingredients
 - Concentration of controlled ingredients
 - Toxicity of the controlled ingredients

MSDS – Information Required

3) Physical Data

- Physical property: Solid, Liquid or Gas

4) Fire or Explosion Hazard

- How likely the product is to ignite under various conditions

5) Reactivity Data

- Information about chemical stability of the product and its reactivity with other known materials.

MSDS – Information Required

6) Toxicological Properties

- Information about how the hazard enters the human body
- Short term effects
- Long term effects (if known)

7) Preventive Measures

- Information on how to protect workers health and safety during transportation, storage, use and disposal.
- Provide emergency measures.

MSDS – Information Required

8) First Aid Measures

- Information for safe evacuation and immediate treatment if exposed

9) Preparation Information

- Name and phone number of the person or group who provided the MSDS sheet.
- Date the MSDS sheet was produced.

Exceptions

The federal WHMIS legislation does not apply to the sale or importation of:

- Restricted products when packaged as consumer products;
- Explosives within the meaning of the *Explosives Act*;
- Cosmetics, drugs, food and devices within the meaning of the *Food and Drug Act*;
- Pest control products within the meaning of the *Pest Control Products Act*;
- Prescribed substances within the meaning of the *Atomic Energy Control Act*;
- Wood or products made of wood;
- Manufactured articles;
- Tobacco or products made of tobacco;
- Hazardous wastes.

WHMIS and the employer

- Three (3) duties:

- 1) Ensure controlled products are labelled or identified

- 2) Obtain MSDS sheets for each controlled product

Note1: Must be updated every 3 years.

Note2: Can be on a computer, if employees are trained to get them.

- 3) Educate workers

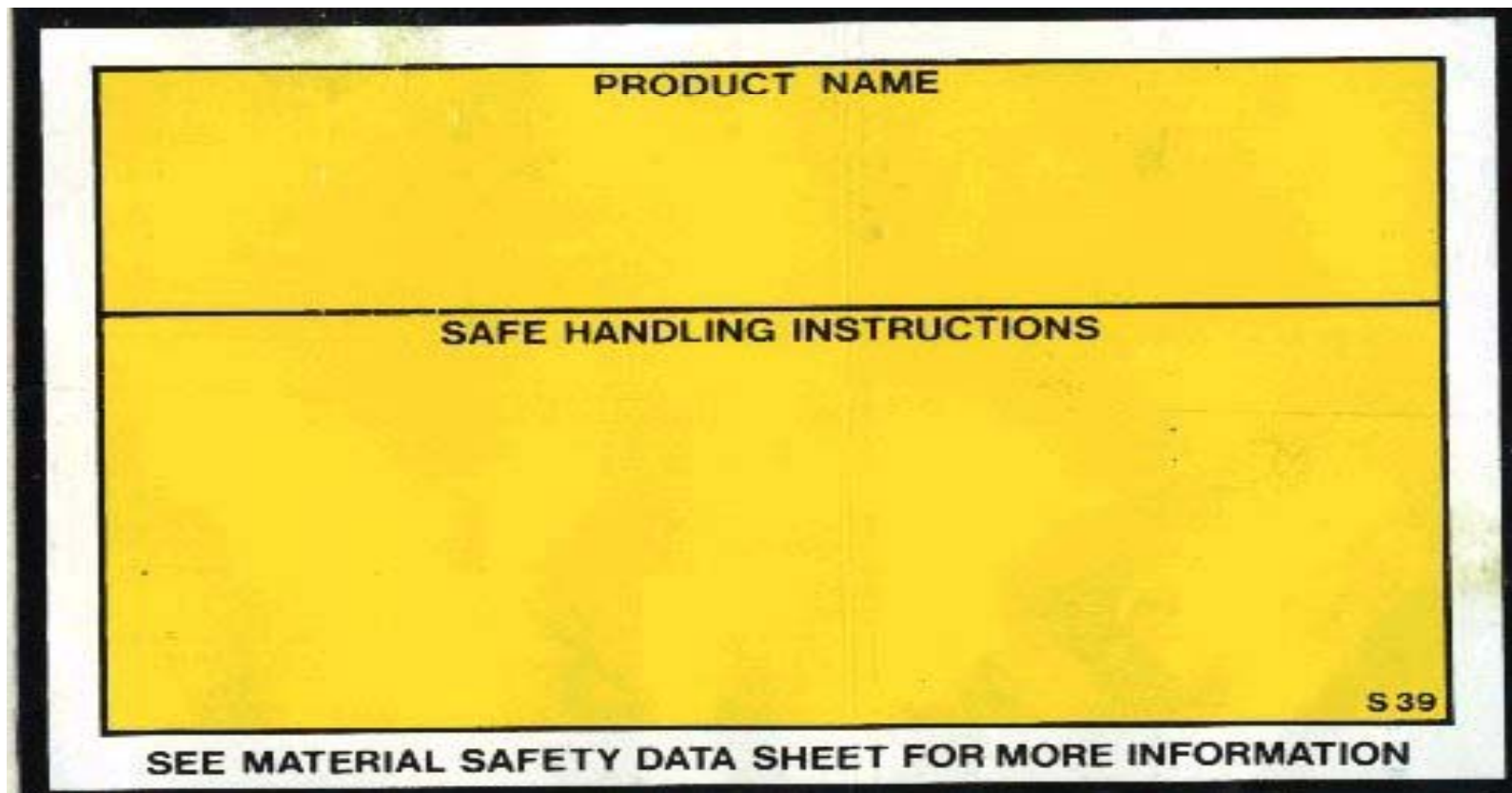


WHMIS and the employer

- **The workplace label:**
- This is a label made by employer **ONLY** for the workplace to identify a product that doesn't already have a WHMIS label.
- Must have 3 things:
 - 1) Identifies the product
 - 2) Information about safe handling of the product
 - 3) Statement to see MSDS for further information
- Does **not** require a symbol

Worker Label

- Example of worker's or lab label. Note the three requirements: Product name, safe handling, additional info.



Decanting

- There are rules for decanting from a large container to a smaller container:
 - 1) If the product is decanted and used immediately, no label is required.
 - 2) A product can be decanted into another container if and only if:
 - **The controlled product is used only by the worker who decanted it.**
 - **The product is used during the shift of the worker**
 - **The contents are identified with an employer WHIMS label**

Employer Education Programs

The worker education program must cover the following 6 areas:

1. Labels

- The information required, the purpose of the information and the significance of the information.

2. Modes of identification when used at the workplace instead of labels

3. MSDSs

- The information required, the purpose of the information and the significance of the information.

4. Procedures for the safe use, storage, handling and disposal of a controlled product, including a controlled product in a piping system or vessel

5. Procedures to be followed where fugitive emissions are present

6. Procedures to be followed in case of an emergency involving a controlled product.

Employer Education Programs

- The employer must refresh all workers WHMIS knowledge each year.
- This is done in case some changes have been made.
- New work procedures
- And review updated MSDSs

WHMIS and the Worker **THAT'S YOU!**

- **Workers rights:**

- Right to know about hazards they are exposed to in the workplace
- Right to review labels and MSDS sheets before work is done
- Right to instruction and training
- Right to be consulted regarding the development and implementation of the instruction and training
- **Must review WHMIS annually**

WHMIS and the worker

- Worker's Responsibilities
 - Workers are to inform to their employer of missing labels or labels that are illegible
 - Workers are to inform their employers of any violation of the Atcs or Regulations.



WHMIS in the Lab

Special rules exist for laboratories:

1) A full suppliers label is not required if:

- The product comes from a laboratory supply house
- The product is intended for use in a laboratory
- Individual containers of the product hold less than 10 kilograms.

2) An appropriate label must:

- identifies the product
- Gives the appropriate risk phrases, handling precautions and first aid measures
- Indicates that an MSDS is available, if there is one.
- No border is required, hazard symbol or supplier information

WHMIS – TERMS

The following are terms that may be found on an MSDS

LD₅₀:

The Lethal Dose of a material that when fed to test animals causes 50% of them to die (the lower the number, the more toxic the material)

LC₅₀:

The Lethal Concentration of a material in the air when breathed by test animals causes 50% of them to die (the lower the number, the more toxic the material)

pH:

The measure of the acidity or alkalinity of a material
Range is 0 to 14
Less than 7 are acids
Greater than 7 are bases
The closer to 0 or 14 the more corrosive the material

WHMIS – TERMS

The following are terms that may be found on an MSDS

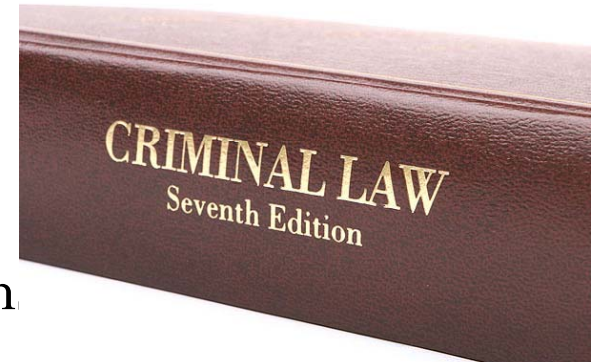
Flash Point: The lowest temperature at which flammable vapours will burst into flame with a source of ignition

Auto Ignition Temperature: The lowest temperature at which flammable vapours will spontaneously burst into flame

Boiling Point: The lowest temperature at which a liquid will turn into a vapour

Freezing Point: The highest temperature at which a liquid will turn into a solid

Enforcement (MOL)



- Ontario's WHMIS legislation gives the in power, and that is the power to stop the use of a particular controlled product.
- For a violation of the WHMIS provisions in either the *Occupational Health and Safety Act* or Ontario's WHMIS Regulation, the penalties on summary conviction are the same as the penalties for any other violation of the Act or its regulations, namely, a fine of up to \$25,000 and/or a term of up to 12 months in jail.

Prosecution for Suppliers



- The penalties on summary conviction are a fine of up to \$100,000 and/or a term of up to 6 months in jail. On proceedings by way of indictment, a fine of up to \$1,000,000 and/or a term of up to 2 years in jail may be imposed.

More information

- For a full description of the legislations and regulations:

<http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index-eng.php>

- For a more complete WHMIS background, please read:
Canadian Centre for Occupational Health and Safety

<http://www.oshforeveryone.org/leg/documents/ont/oneoha/ongwhme0.htm>

**REMEMBER YOU MUST PASS WITH >70% ON
THE TEST TO CONTINUE IN THIS COURSE!!!
QUESTIONS WILL COVER SUBJECTS COVERED IN
THIS DOCUMENT.**