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
- Ontario WHMIS requirements are set by the OHSA

Why was WHMIS created?

- WHMIS was created as a response to a workers “right to know” about both the safety and health hazards associated with the hazardous materials they might use at work
- WHMIS was also created to reduce injuries and illnesses associated with handling hazardous materials in the workplace

WHMIS 2015

- Globally Harmonized System
  - Hazardous Products Regulation
  - Internationally recognized system
  - Comprehensive classification criteria
    - Hazard severity
  - Harmonized communication of chemical hazard information
    - Reduce worker risks
    - Mitigate hazard communication costs
    - Promote international trade

WHMIS 2015 vs. WHMIS 1988

WHMIS 2015	WHMIS 1988
Hazardous Products Regulations	Controlled Products Regulations
32 Hazard Classes • Multiple hazard categories	6 Hazard Classes • 3 divisions
Safety Data Sheet (SDS) • 16 sections • No need to review	Materials Safety Data Sheet (MSDS) • 9 sections • Review every 3 years
Pictograms • Red square on one of its points	Symbols • Black circle

WHMIS Components

- WHMIS is composed of **3 main elements** to communicate the hazards of controlled products:
    1. Labels – affixed to containers of hazardous materials 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

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 labels
    - Preparing and providing SDS’s for customers

Employer Responsibilities

- Employer responsibilities include:
  - Ensure all hazardous products at their work site have GHS labels
  - Provide access to SDS's of hazardous products to employees and up date them as necessary
  - Educate workers on how to read and recognize GHS 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

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

- WHMIS may not apply if another act or regulation is in place
- 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

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 the 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 for training employees on the safe use, handling, and storage of these materials

WHMIS and Radioactive Materials

- GHS labels and SDS's are still required when there are mixtures of radioactive nuclide(s) and non-radioactive carrier material whereby:
  - The carrier material is greater than 1 mL / 1 g
  - The carrier material poses a carcinogenic, toxic, or infectious hazard

GHS Hazard Groups & Classes

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

Physical Hazard Classes		
Flammable gases	Flammable aerosols	Oxidizing gases
Gases under pressure	Flammable liquids	Flammable solids
Self-reactive substances and mixtures	Pyrophoric liquids	Pyrophoric solids
Self-heating substances and mixtures	Substances in mixtures which, in contact with water, emit flammable gases	Oxidizing liquids
Oxidizing solids	Organic peroxides	Corrosive to metals
Combustible dusts	Simple asphyxiants	Pyrophoric gases
Physical hazards not otherwise classified		

GHS Hazard Groups & Classes

- Health Hazards Group: based on a products ability to result in a health related issue

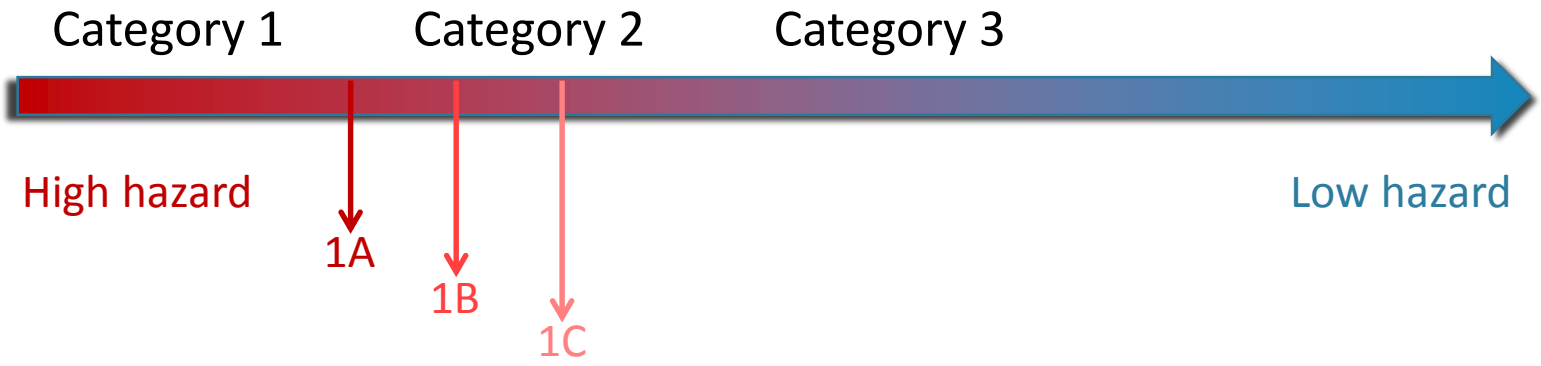
Health Hazard Classes		
Acute toxicity	Skin corrosion/irritation	Serious eye damage/irritation
Respiratory or skin sensitization	Germ cell mutagenicity	Carcinogenicity
Reproductive toxicity	Specific target organ toxicity – single exposure	Specific target organ toxicity – repeated exposure
Aspiration hazard	Biohazardous infectious materials	Health hazards not otherwise classified

GHS Hazard Groups & Classes

- Environmental Hazards Group: based on a products 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

GHS 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



Physical Hazard Class Descriptions

Hazard Class(es)	Description
Flammable gases; Flammable aerosols; Flammable liquids; Flammable solids	Products can readily ignite, creating hazard for fire or explosion
Oxidizing gases; Oxidizing liquids; Oxidizing solids	Oxidizers that can cause a fire or explosion or intensify a fire
Gases under pressure	Gases under high pressure in a cylinder or container that have potential to explode and cryogenics that can cause severe burns
Self-reactive substances and mixtures	Products which may react to create a fire or explosion, or upon heating cause a fire or explosion
Pyrophoric liquids; Pyrophoric solids; Pyrophoric gases	Products that ignite spontaneously in the presence of air
Self-heating substances and mixtures	Products that can ignite in the presence of air after a duration of time

Physical Hazard Class Descriptions Continued

Hazard Class(es)	Description
Substances and mixtures which, in contact with water, emit flammable gases	Products that react with water to release a flammable gas
Organic peroxides	Upon heating, products that can cause a fire or explosion
Corrosive to metals	Products that are corrosive to metals
Combustible dust	Finely divided particles that, if in air, can catch fire or explode upon ignition
Simple asphyxiants	Gases that displace air, causing suffocation
Physical hazards not otherwise classified	Products that, based off of their physical and chemical properties, can result in serious injury or death of a person

Health Hazard Class Descriptions

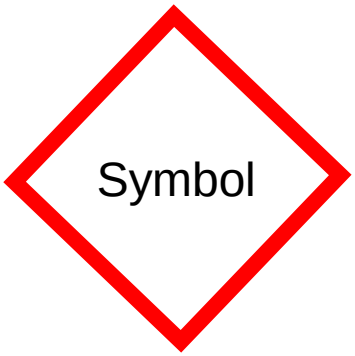
Hazard Class(es)	Description
Acute toxicity	Products that are fatal, toxic, or harmful if they come in contact with the skin, are inhaled, or swallowed
Skin corrosion/irritation	Products that can cause severe skin burns or irritations
Serious eye damage/eye irritation	Products that can cause severe eye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

Health Hazard Class Descriptions Continued

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

GHS 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



Corrosion

- Physical hazard classes:
  - Corrosive to metals – Category 1
- Health hazard classes:
  - Skin corrosion/irritation
    - Skin corrosion – Category 1, 1A, 1B, 1C
  - Serious eye damage/eye irritation
    - Serious eye damage – Category 1

Exclamation Mark

- Health hazard classes:
  - Acute toxicity – Category 4
  - Skin corrosion/irritation
    - Skin irritation – Category 2
  - Serious eye damage/eye irritation
    - Eye irritation – Category 2 and 2A
  - Respiratory or skin sensitization
    - Skin sensitizer – Category 1, 1A, 1B

Exploding Bomb

- Physical hazard classes
  - Self-reactive substances and mixtures
    - Types A and B
    - Type B must always appear with flame pictogram
  - Organic peroxides
    - Types A and B
    - Type B must always appear with flame pictogram

Flame

- Physical hazard classes
  - Flammable gases – Category 1
  - Flammable aerosols – Category 1 and 2
  - Flammable liquids – Category 1, 2, and 3
  - Flammable solids – Category 1 and 2
  - Pyrophoric liquids – Category 1
  - Pyrophoric solids – Category 1
  - Pyrophoric gases – Category 1
  - Self-heating substances and mixtures – Category 1 and 2
  - Substances and mixtures which, in contact with water, emit flammable gases – Category 1, 2, and 3

Flame Continued

- Physical hazard classes
  - Self-reactive substances and mixtures
    - Types B, C, D, E, and F
    - Type B must always appear with exploding bomb pictogram
  - Organic peroxides
    - Types B, C, D, E, and F
    - Type B must always appear with exploding bomb pictogram

Flame Over Circle

- Physical hazard classes
  - Oxidizing gases – Category 1
  - Oxidizing liquids – Category 1, 2, and 3
  - Oxidizing solids – Category 1, 2, and 3

Gas Cylinder

- Physical hazard classes
  - Gases under pressure
    - Compressed gas, liquefied gas, refrigerated liquefied gas, dissolved gas

Health Hazard

- Health hazard classes
  - Respiratory or skin sensitization
    - Respiratory sensitizer – Category 1, 1A, and 1B
  - Germ cell mutagenicity – Category 1, 1A, 1B, and 2
  - Carcinogenicity – Category 1, 1A, 1B, and 2
  - Specific target organ toxicity
    - Single exposure – Category 1 and 2
    - Repeated exposure – Category 1 and 2
  - Aspiration hazard – Category 1

Skull and Crossbones

- Health hazard classes
  - Acute toxicity
    - Oral – Category 1, 2, and 3
    - Dermal – Category 1, 2, and 3
    - Inhalation – Category 1, 2, and 3

Biohazardous Infectious Material

- Health hazard classes – UNIQUE TO CANADA
  - Biohazardous infectious material – Category 1

Hazards Not Otherwise Classified

- Physical hazards not otherwise classified
- Health hazards not otherwise classified
  - Require a pictogram appropriate to the hazards associated with the hazardous product
  - Multiple pictograms can be used to account for all hazards

Hazard Classes Without Pictograms

- Physical hazard classes
  - Flammable gases – Category 2
  - Flammable liquids – Category 4
  - Self-reactive substances and mixtures – Type G
  - Combustible dusts – Category 1
- Health hazard classes
  - Simple asphyxiants – Category 1
  - Serious eye damage/eye irritation
    - Eye irritation – Category 2B
  - Reproductive toxicity – Effects on or via lactation

Labels

- Labels are required on all hazardous products
- Suppliers and employers are both responsible for ensuring labels are affixed to hazardous products
- Two types of labels
  - Supplier labels
    - All hazardous products received from a supplier require a label
  - Workplace labels
    - Used by employers when supplier labels are not available, have been damaged, the material has been transferred to a different container, or a material has been produced and is being used at the workplace
    - If a controlled product is transferred to a new container and consumed within one shift, a workplace label is not required

Supplier Labels

- Requirements
  - Product identifier
  - Initial supplier identifier
  - Pictogram(s)
  - Signal word
    - Indicates level of hazard
    - Two words: “Danger” or “Warning”
  - Hazard statement
    - Brief sentences that describe the exact hazard
    - E.g. Extremely flammable gas; Fatal if inhaled

Supplier Labels

- Requirements continued
  - Precautionary statement
    - Advisory statements to prevent exposure to and improper handling/storage of hazardous products
    - 5 types of precautionary statements
      - General – E.g. Read label before use
      - Prevention – E.g. Keep container tightly closed
      - Response – E.g. If inhaled, get medical attention/advice
      - Storage – E.g. Store away from other materials
      - Disposal – E.g. Dispose of contents in accordance with regulatory requirements
  - English and French

Product identifier

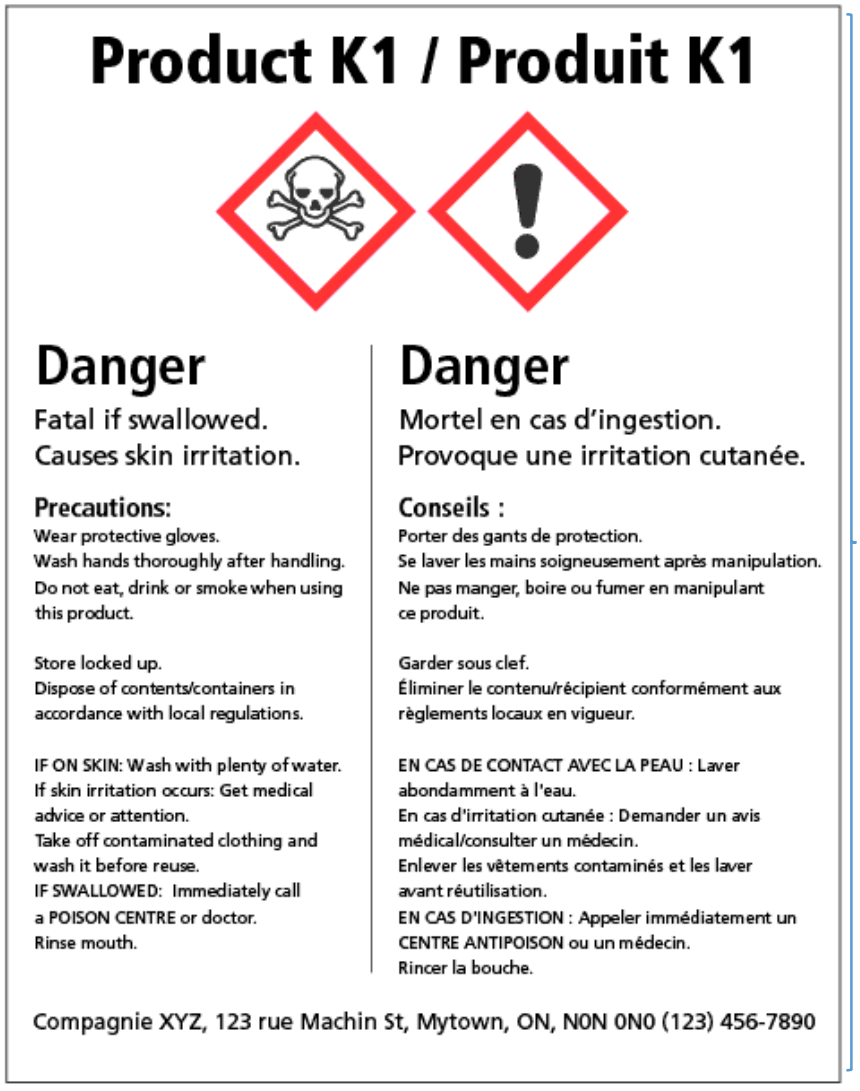
Pictogram(s)

Signal word

Hazard statement

Precautionary statements

Initial supplier identifier



English and French

Supplier Labels

- Updates are required when:
  - New and significant data becomes available about the product, changing the products classification in a category or subcategory, or results in classification in an additional hazard class
- Updates are to be provided by:
  - The supplier
  - Within 180 days of the supplier being aware of the new and significant data

Small Container Labels

- Hazardous products packaged in containers **less than 100 mL** require the following on their label
  - Product identifier
  - Pictogram(s)
  - Signal word
  - Initial supplier identifier
  - Available in English or French

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

Safety Data Sheets (SDS)

- All hazardous products must have a SDS
- Provide more detailed hazard information than labels
- Suppliers must supply a current SDS at the time of sale
  - Suppliers must update the SDS when they become aware of any significant new data
  - SDS updates are to be provided within 90 days
  - Last date of update found at the end of SDS
  - Employers are responsible for having an up-to-date SDS
- SDS must be accessible to **all** workers
  - Store in a readily accessible area known to everyone
    - May be computerized
  - Referenced and understood **before** handling a hazardous product

Section	Hazardous Products Regulations Heading
1	Identification
2	Hazard identification (including classification and label text)
3	Composition/information on ingredients
4	First-aid measures
5	Fire-fighting measures
6	Accidental release measures
7	Handling and storage
8	Exposure controls/personal protection
9	Physical and chemical properties
10	Stability and reactivity
11	Toxicological information
12-15	Ecological, transport and regulatory information, disposal considerations
16	Other information

SDS Section Information

1. Identification
   - Product identifier
   - Additional methods of identification
   - Recommended use
   - Usage restrictions
   - Canadian supplier identifier

2. Hazard identification
   - Hazard classification
     - Class, category, subcategory, type
   - Label information
     - Symbol, signal word, hazard statement(s), precautionary statement(s))
   - Other hazards not classified

3. Composition/information on ingredients
   - For hazardous products that are a material or substance
     - Chemical name, common name/synonyms, CAS number, other unique identifiers, chemical names of impurities, stabilizers, or additives
   - For materials or substances in a mixture that are classified as a health hazard
     - Chemical name, common name/synonyms, CAS number, other unique identifiers, concentration
4. First-aid measures
   - Measures by exposure type
     - Inhalation, skin contact, eye contact, ingestion
   - Vital symptoms and effects
   - If medical attention or treatment is required

5. Fire-fighting measures
    - Suitable and unsuitable extinguishing media
    - Hazards associated with the hazardous product in fire conditions
    - Personal protective equipment and precautions for fire-fighters

6. Accidental release measures
    - Personal protective equipment, precautions, and emergency procedures
    - Containment method, including required materials
    - Prescribed clean-up

7. Handling and storage
    - Information on safe handling
    - Prescribed storage methods
        - Incompatible materials

8. Exposure controls/personal protection
    - Occupational exposure information for chemical and biological exposures and appropriate control mechanisms
    - Engineering controls
    - Personal protective equipment recommendations

9. Physical and chemical properties
    - Not all may be applicable
        - Appearance (state of matter, color)
        - Odour
        - Odour threshold
        - pH
        - Melting/freezing point
        - Initial boiling point/boiling point range
        - Flash point
        - Evaporation rate
        - Flammability (solid, gas)
        - Lower flammable/explosive limit

10. Stability and reactivity
    - Not all may be applicable
        - Reactivity
        - Stability
        - Possible hazardous reactions
        - Undesirable conditions that can impact material (ie. Shock, light)
        - Incompatible materials
        - Decomposition products

11. Toxicological information
    - Description of toxic health effects and the data which verified these claims
        - Routes of exposure
        - Symptoms related to the toxic health effects
        - Delayed, immediate, and chronic effects from short- and long-term exposures
        - Values/measurements of toxicity

12. Ecological information
    - Information may not be on SDS
        - Ecotoxicity
        - Persistence and degradability
        - Bioaccumulation potential
        - Mobility in soil
        - Other adverse effects

13. Disposal considerations
    - Information may not be on SDS
        - Safe handling for disposal
        - Methods for disposal, including contaminated packaging

14. Transport information
    - Information may not be on SDS
        - UN number
        - UN proper shipping name
        - Transport hazard class(es)
        - Packing group
        - Environmental hazards
        - Transport in bulk
        - Special precautions

15. Regulatory information
    - Information may not be on SDS
        - Safety, health, and environmental regulations pertaining to the product

16. Other information
    - Latest date the SDS was revised