# Safety around the Classroom (review from last class!)

1. Look around and locate safety features in the classroom. Discuss each with a classmate.

- What is it?
- How does it work?
- When should you use it?
- Who should use it?
- Anything you can’t see in the classroom?

# HHPS

- **HHPS = Hazardous Household Products Symbols**
- These are **consumer products** (sold in regular stores)
  - ***Examples***

**Which rooms in your house have you seen these symbols?**
***(make a list with the person you're sitting beside)***

# HHPS

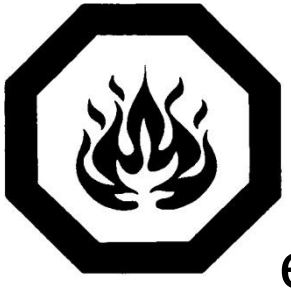
- **Hazardous Household Products Symbols**

## CORROSIVE

Eats or wears away other materials.

## EXPLOSIVE

Explodes or gives off deadly vapours.



## FLAMMABLE

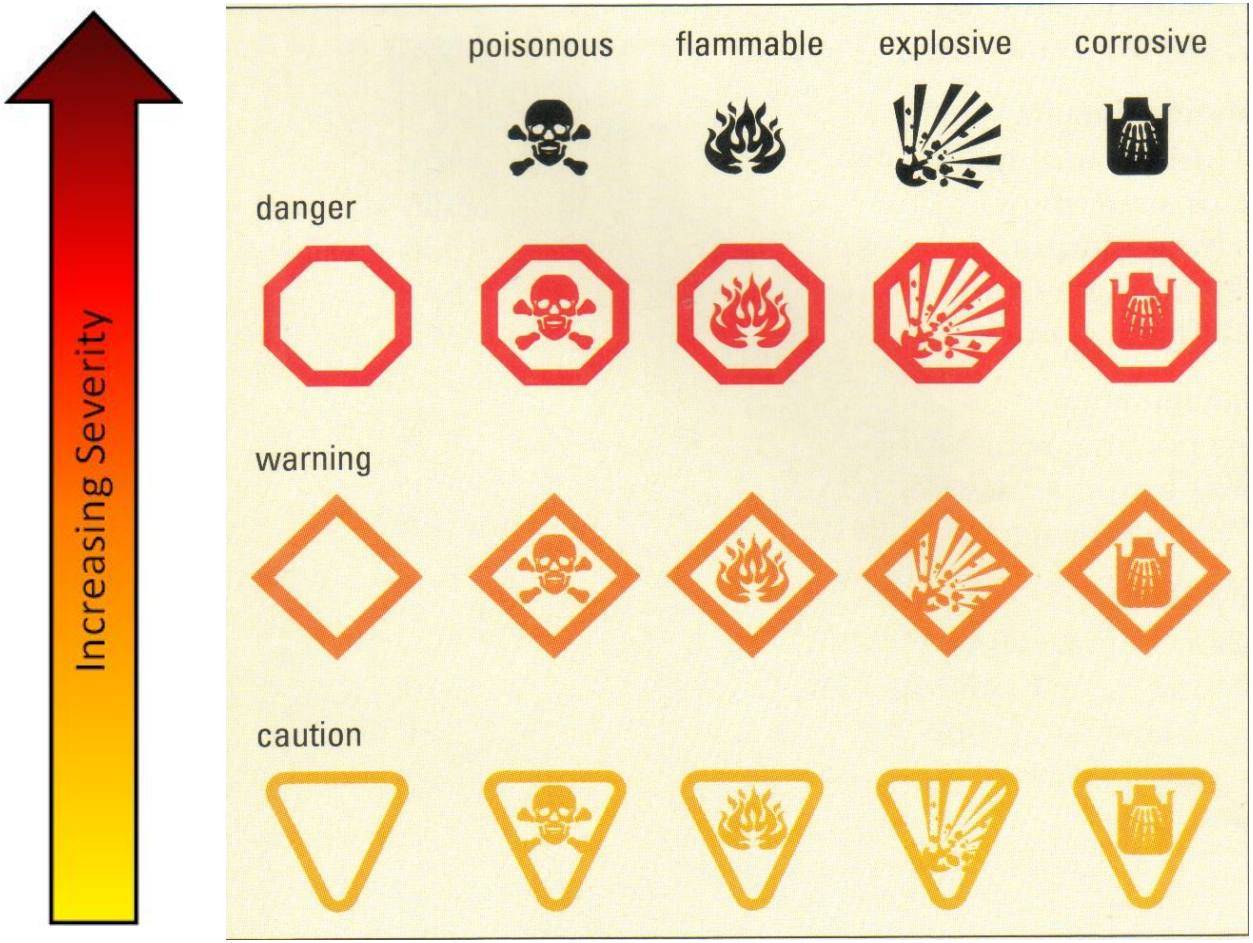
Ignites if exposed to heat or sparks.

## POISONOUS

May cause sickness or death if swallowed.

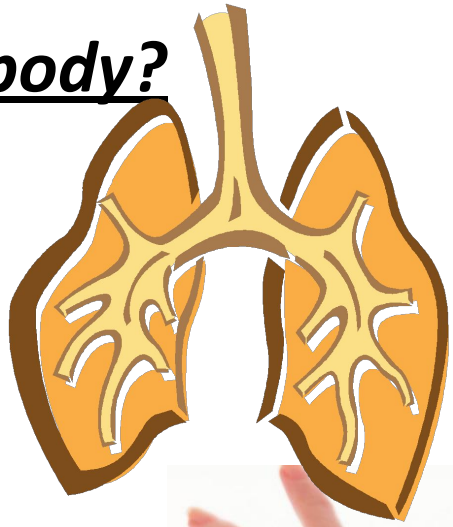
# HHPS

- **Hazardous Household Products Symbols**



# WHMIS

***How do hazardous materials get into the body?***

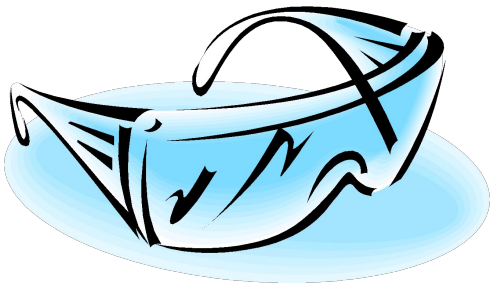


- **Inhalation**
  - Fumes or particles are breathed in
- **Absorption**
  - Chemicals can be absorbed by the skin and enter the body
- **Ingestion**
  - Chemicals enter the body through the stomach

# WHMIS

***How can we protect ourselves?***

- **hand washing**
- **Personal Protective Equipment** (PPE)
  - Equipment such as masks, **goggles** and **gloves** can be used to help **decrease the danger** of using certain products



# WHMIS

- **WHMIS** = **Workplace Hazardous Materials Information System**
- These are products used in industry or **labs**
    - Ex. many of the chemicals we'll use in this class
- WHMIS is a system designed to **provide information about hazardous materials**
- The system **groups** chemicals with **similar** properties or **hazards**
- Each group has a **symbol** to help people identify the hazard quickly

# Curiosity about the world

- **Why is it important to understand WHMIS information, including Material Safety Data Sheets, before using any chemicals?**
  - know what conditions it will react in
  - know what type of protection is required
  - know how to deal with spills
  - how to deal with splash in the eyes
  - how to deal with contact on the skin

# WHMIS

- **Workplace Hazardous Materials Information System**
- Gives workers, employers and **students** key safety and handling information on potentially dangerous chemicals used on the job

- WHMIS has 3 parts
  1. Warning label
  2. Safety Data Sheets (SDS)
  3. Worker (Student!) training

# Now called GHS

- **In 2015, WHMIS was changed to**

**GHS**

**Global Harmonized System**

# GHS

1. Warning Labels

**Compressed gas**

- Gasses under pressure
- May explode if heated

**Flammable**

- Potential fire hazard
- Keep away from heat or potential ignition

# GHS

1. Warning Labels

**Oxidizing material**

- will produce oxygen gas which would help flammable or combustible material burn
- Keep away from combustible materials

**Acute Toxicity**

- Poisons (can cause death quickly)
- Harmful if ingested or gets on body

# GHS

1. Warning Labels

**Health Hazard**

- Can cause chronic health problems but not immediately upon contact
- Repeated exposure can cause death or permanent damage
- Can cause cancer or birth defects

**Harmful**

- May cause less serious health effects like skin or eye irritation

# GHS

1. Warning Labels

**Environmental Hazard**

- Poisonous to aquatic life
- Can cause long-term damage to aquatic life

**Biohazardous & infectious material**

- May contain biological toxins
- mold, viruses, pathogenic bacteria, etc

# WHMIS

1. Warning Labels

**Corrosive material**

- Caustic or acid materials
- Causes burns, blindness, lung damage
- React with metals

**Explosive or Dangerously Reactive material**

- Material is unstable and can react very easily
- May react violently with water

# WHMIS 2015 PICTOGRAMS

| | | |
|---|---|---|
| **Health Hazard**  | **Flame**  | **Exclamation Mark**  |
| Carcinogen, mutagenicity<br>reproductive toxicity, respiratory sensitizer<br>Specific target organ toxicity-single exposure<br>Specific target organ toxicity-repeated exposure<br>Aspiration hazard | Flammable gases, aerosols, liquids, solids<br>Pyrophoric liquid, solid, gas<br>Self-heating substances<br>Emits flammable gas in contact with water<br>Self-reactive<br>Organic peroxide | Harmful<br>Irritant (skin and eye)<br>Skin sensitizer<br>Acute toxicity (harmful via oral, skin, inhalation)<br>Respiratory tract irritant |
| **Gas Cylinder**  | **Corrosion**  | **Exploding Bomb**  |
| Gas under pressure | Skin corrosion<br>Serious eye damage<br>Corrosive to metals | Explosives<br>Self-reactive substances and mixtures<br>Organic peroxides |
| **Flame Over Circle**  | **Skull and Crossbones**  | **Biohazardous Infectious Material**  |
| Oxidizers (liquids, solids, gases) | Acute toxicity (fatal or toxic via oral, skin, inhalation) | Biohazardous infectious material |

# WHMIS

1. Warning Labels

Supplier labels??

Workplace labels??

# SDS (formerly MSDS)

2. **SDS = Safety Data Sheet**

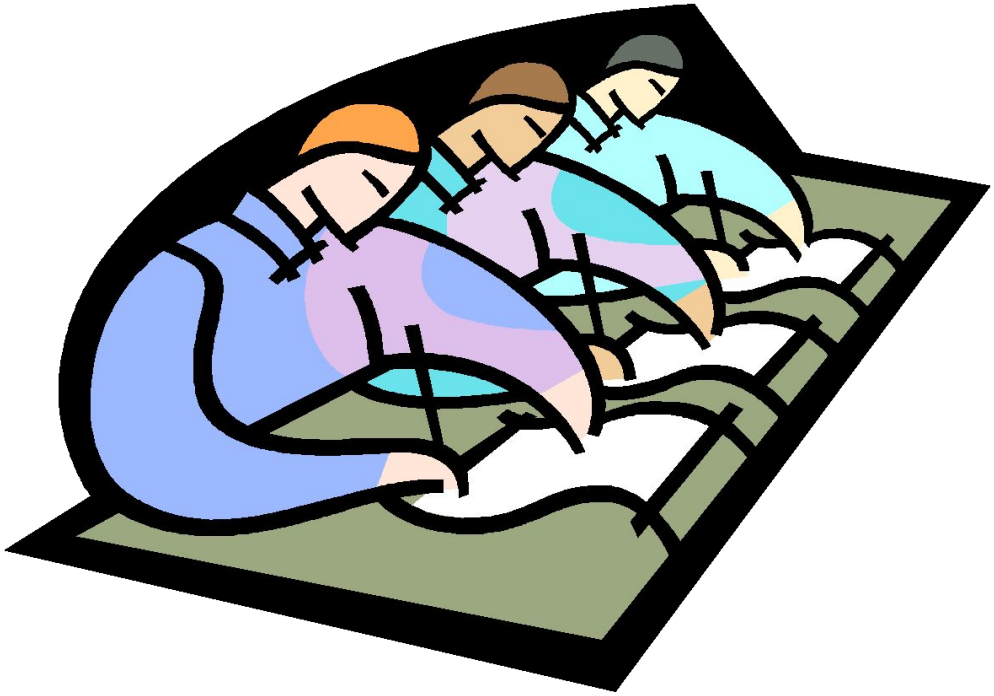
   **MSDS = Material Safety Data Sheet**

- Gives you more **specific details** about a chemical
  - How to **deal with spills**
  - How to **treat yourself** if you come in contact with the chemical

# WHMIS Training

3. Worker (**Student**!) Training

- WHMIS training is **required** in most workplaces and for **all science students**



# Curiosity about the world

- **What sources of information are available on the safety or environmental implications of chemicals and chemical reactions?**
  - SDS
  - WHMIS labels

http://nobel.scas.bcit.ca/debeck_pt/science/images/labsafety.jpg

http://marineinsight.com/wp-content/uploads/2011/04/msds.jpg

- **Why is it important to ensure that these sources are up to date?**
  - To ensure that you have the most current way of dealing with potential problems that may arise

# Read an SDS

- Go over your SDS:
  - identify hazard symbols, look at hazard categories (eg acute toxicity, Category 1)
  - Route of entry if given (eg fatal if contact with skin)
  - First Aid
  - spill clean up
  - PPE
  - Toxicological - Look for LD50 (and route/animal) or LC50

# How to interpret LD50 & LC50