



WHMIS



&

SAFETY IN THE SCIENCE LAB



KNOW AND IDENTIFY



Workplace **H**azardous
Materials **I**nformation **S**ystem

Symbols for products used at school



WHAT INFORMATION DOES **WHMIS** PROVIDE?



WHMIS provides information through:

LABELS on containers of controlled products

MSDS for each controlled product

SCIENCE EDUCATION INFORMATION



BIOHAZARDOUS

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

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



CORROSIVE

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.

Bleach, Battery Acid, Ammonia and Hydrochloric Acid are examples.



FLAMMABLE

Class B

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.

Oil and Gasoline are examples of flammable materials.



COMPRESSED GAS

Class A

A compressed gas is a gas at room temperature **20 °C** and pressure, packaged as a pressurized gas by compression or refrigeration and is usually quite heavy.

The potential hazard of compressed gases occurs when sudden rupturing of the container causes it to become a dangerous projectile.

Includes such things such as **Propane** and **Acetylene** bottles, as well as **Oxygen** tanks.



OXIDIZING

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.

Ozone, Chlorine, and Nitrogen Dioxide are oxidizing materials which support a fire and are highly reactive.



POISONOUS

Materials Causing *Immediate and Serious* Toxic Effects

Class D-1

This symbol is the most common found symbol in homes
It is found on materials that are toxic when ingested
These materials may be classified as toxic or very toxic
based on information such as **LD50**

Bleach, Mr. Clean, Tide, Cyanide and rat poisoning are
very toxic. Most household chemicals and cleaners
contain this symbol

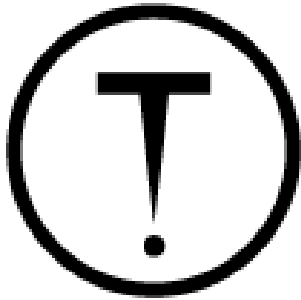


DANGEROUSLY REACTIVE

Certain chemicals when mixed, undergo vigorous reactions and can produce harmful side effects.

They may react violently 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.

Chemicals that should not be mixed are **bleach**, **drain cleaner**, and **ammonia** because, when combined, they form a toxic gas.



TOXIC

Materials Causing Other Toxic Effects

Class D-2

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.

Asbestos, Arsenic and Nicotine are toxic substances.

DRESS APPROPRIATELY



Tie back long hair.

Do not wear loose sleeves.

Do not wear shorts.

Do not wear sandals.

Do not wear contact lenses.



KNOW WHAT IS EXPECTED

Read everything thoroughly before you begin doing anything

No food or beverages.



No gum chewing.

Do not perform unauthorized experiments.

Never work alone in the lab.

Report all accidents immediately to your teacher.

PREPARE A CLEAN WORK AREA

Bring only those materials that are essential to completing the lab activity to your work area

Keep aisles clear

No running

Do not leave experiments unattended and extinguish burners when away from desk



WAIT FOR PERMISSION TO START

All experiments performed in the Science lab must be performed under the supervision of the teacher

It is essential that the teacher knows you are ready to begin, so you can be properly supervised



USE COMMON-SENSE

Whenever special attention is needed in a Lab activity you will see the word **Caution**



This means that special care must be taken when proceeding with this activity



SAFETY EXPECTATIONS

Work quietly and carefully

Never work alone

Tell your supervisor of health-related problems, allergies

Do not attempt Lab activities at home unless told to do so by your teacher, and only under the direct supervision of an adult

GENERAL SAFETY

Touch substances only when told to do so

Smell substances using the proper technique - **wafting**
Chemicals should always be smelled by holding the container in front of your face and slowly (in a circular motion) **wafting** the vapors toward your nose. Never place the chemical right at your nose and inhale.

Pour substances properly and safely



GLASSWARE PRECAUTIONS

Use only heat-resistant glass - **Pyrex** or **Kimax**
Beware of hot glass. Hot glass looks like cold.

Never use cracked glass.



Always keep the open end of the test tube pointed away from everyone.



Never allow any container to boil dry.



ADDITIONAL PRECAUTIONS



Report broken or damaged equipment immediately
(**DO NOT USE IT**)

Clean up work area completely when you are finished

Report all accidents to the teacher immediately
(no matter how minor)



CLEAN-UP AND DISPOSAL

Clean up all spills immediately

Wash all glassware thoroughly and place in drying racks

Clean up work area and return all equipment and materials as directed by your teacher

Use the chemical waste bins to dispose of harmful chemical substances and dispose of broken glassware in the broken glass container (metal), following your teacher's directions

STORAGE OF CHEMICALS

R - RED - Flammable. Store in area designated for flammable reagents.

Y - YELLOW - Reactive and Oxidizing. These chemicals may react violently with air, water, or other substances. They should be stored away from flammable and combustible materials.

B - BLUE - Health hazard. These chemicals are toxic if inhaled, ingested, or absorbed through the skin. They should be stored in a locked cabinet.

W - WHITE - Corrosive. These chemicals may harm skin, eyes, mucous membranes. They should be stored away from red, yellow, and blue-coded reagents.

G - GRAY - Moderate or minimal hazard. According to current data, these chemicals do not pose more than a moderate hazard in any category.

FIRST AID

Rinse off substances immediately that come into contact with skin or clothing



Wash hands before and after handling substances and before leaving the Lab

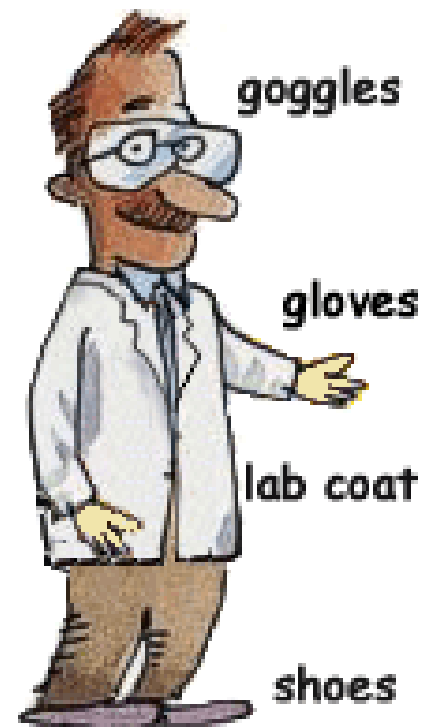
Treat burns using cold water or ice

PERSONAL PROTECTIVE EQUIPMENT

Wear chemical splash goggles and protective shoes.

Wear chemical resistant gloves when necessary.

Wear a lab coat and/or a chemical resistant apron when necessary.



SAFETY EQUIPMENT

Know the location of all of the science lab safety equipment, including:

Safety Shower
Eye Wash
Fire Blankets
Fire Extinguishers
Fire Exits
Telephone
First Aid Kit



USING HOT PLATES

Hot Plates

Use hot plates that have thermostatic controls.
Use a beaker of water on the hot plate to heat substances in test tubes.

Use tongs or gloves to pick up hot objects.

Turn off hot plate when not in use.

Unplug cords by pulling on the plug, not the cord.

Report and replace equipment that has frayed or has been damaged cords.

Make sure electrical cords are placed properly where no one will trip over them.



USING OPEN FLAMES



Locate fire safety equipment before using any open flame (fire blanket, fire extinguishers, fire alarm, first-aid kit)

Know the proper procedures for using a **Bunsen Burner**



Remove all flammable substances from the room before lighting a flame

Use a test tube holder if the test tube is being heated in an open flame. Point the open end away from yourself and others. Gently move the test tube back and forth over the flame so that it is heated evenly

CLASSES OF FIRES

A



Class A fires are those fueled by materials that, when they burn, leave a residue in the form of ash, such as paper, wood, cloth, rubber, and certain plastics.

B



Class B fires involve flammable liquids and gasses, such as gasoline, paint thinner, kitchen grease, propane, and acetylene.

C



Class C fires are those that involve energized electrical wiring or equipment (motors, computers, panel boxes)


Note: if the electricity to the equipment is cut, a Class C fire becomes one of the other three types of fires.



Class D fires involve exotic metals, such as magnesium, sodium, titanium.

FIRE EXTINGUISHERS

Know the Different Types

Type of Extinguisher	How It Works	Classes of Fire			
		A	B	C	D
	Water	X		NEVER	
	CO2		X	X	
	Dry Chemical	X	X	X	
	Halon		X	X	
	Met-L-X (Sand)				X

To remember how to use a fire extinguisher, think of **PASS**.

P **P**ull the locking pin.

A **A**im the nozzle at the base of the fire.

S **S**queeze the trigger all the way closed.

S **S**weep the extinguisher discharge side to side over the area of the fire.

MSDS

The **Material Safety Data Sheets** are important information resources for Science students.

Each MSDS includes the following:

- technical information on the substance
- a list of its hazardous ingredients
(especially if it's a mixture)
- chemical hazard data
- control measures
- personal protective equipment that should be used
- instructions in accident prevention while using the substance
- specific handling, storage and disposal procedures
- emergency procedures to follow in the event of an accident.



SAFETY CONTRACTS

Read the safety contract carefully

Understand what is expected

Review it with your parents

Sign it and return it to your teacher



Safety Contract	
<p>To ensure that a safe and healthful environment is maintained when following the _____ laboratory course, all students should read and follow the safety regulations listed below. To indicate that you have read and understand the safety regulations, you are asked to sign and date this list upon completion of this important task. You should check to see that your partner has likewise read and signed the safety regulations, as you will be allied closely while working together in the laboratory.</p>	
<p>1. Safety goggles, apron, and gloves should be worn by everyone (including visitors) upon entering the science laboratory. 2. Contact lenses should not be worn in the laboratory because there is a possibility that chemicals may infuse under the contact lenses and cause irreparable eye damage. 3. You should prepare for each laboratory lesson by reading all instructions before you come to class. Follow all directions and review with your instructor the safety precautions needed to conduct the experiment safely before you begin. Only materials and equipment authorized by your instructor should be used. 4. Everyone should be alert and proceed with caution at all times in the laboratory. Take care not to bump another student and remain at your lab station while performing an experiment. An unattended experiment can result in an accident. 5. Your apparel should be appropriate for laboratory work. Long hanging necklaces, heavy jewelry, and excessive and bulky clothing should not be worn in the laboratory. Cotton clothing is preferred over nylon, polyester, or wool. 6. Only lab manuals and lab notebooks are permitted in the working areas. Books, purses, and such items should be placed in or at your desk or storage area. 7. No food, beverage, or smoking is permitted in any science laboratory. 8. NEVER taste chemicals. NEVER touch chemicals with your hands. 9. Extreme caution should be exercised when using a Bunsen burner. Keep your head and clothing away from the flame and turn off the Bunsen burner when it is not in use. Gas burners should be lighted only with a sparkner in accordance with your instructor's instructions. Before leaving the laboratory, check to see that all gas valves and hot plates are turned off. 10. You should know the proper fire drill procedures and the locations of fire exits. 11. Work areas and apparatus should be kept clean and tidy. At the conclusion of each laboratory experiment, always clean and wipe dry all apparatus, desks, tables, or laboratory work areas. All equipment that you used during the experiment should be cleaned and returned to the appropriate storage area. 12. Hands should be washed thoroughly with soap at the conclusion of each laboratory period. 13. Everyone should recognize and heed all safety symbols and cautions incorporated in the procedures of the laboratory experiments. 14. All accidents must be reported to the instructor immediately, no matter how minor. 15. NEVER WORK ALONE IN THE LABORATORY. You should only work in the laboratory while under the supervision of your instructor and with your assigned class.</p>	
<p>I, _____ have read and agree to abide by the safety regulations as set forth above and also by any additional printed instructions provided by the instructor and/or corporation. I further agree to follow all other written and verbal instructions given in class.</p>	
Date _____	Student Signature _____
Date _____	Parent Signature _____

EMERGENCY NUMBERS

POLICE FIRE AMBULANCE

911



POISON CENTRE

1-800-268-9017





WHAT DO YOU KNOW ABOUT SCIENCE LAB SAFETY?



You will be given a **TAKE-HOME paper test** to complete
- to ensure that you have reviewed and reinforced all of the
important ideas presented in this slide show about ...
WHMIS & Safety in the Science Lab