Science 8 – Safety in the Chemical Laboratory

Emergency Equipment

In Case of Fire

If a fire does occur, the first step is always to back out of harm's way and evaluate the situation at hand. You need to immediately let the teacher know and warn other students. When evaluating the situation, decide whether this is a controlled fire or an uncontrolled fire.

Controlled Fire: _____a fire which is contained or constrained to a certain area and can not spread to threaten life or property_____

_____

Uncontrolled Fire:___a fire that threatens to destroy life or property_____

_____

If it is a **controlled fire**, it can often be put out by placing a watch glass or inverted beaker over the top of the container. This will prevent ___oxygen_____ from feeding the fire, and it will burn out on its own. Be careful not to spill the contents. If you are unsure what to do, or if you do not think you can do so without spilling the contents, ask the teacher for help. ___Immediately__! If it is a contained fire, it will likely burn out on its own.

If it is an **uncontrolled fire**, everyone must immediately __evacuate___ the room, except for any individuals using a fire extinguisher. As students are filing out, the gas supply in the room should be __shut off__, and all doors should be shut while exiting the room. Additionally, a fire alarm should be pulled to begin the evacuation of the entire building.

What safety equipment can you use in case of a fire?

__Fire extinguisher, fire alarm, fire blanket (for people), sand, inverted beaker or watch glass_____

_____

In Case of a Chemical Spill

If a chemical spill occurs, there are a few steps you need to take. First, if the chemical spills onto your hands, you need to immediately begin to __rinse____ your hands. If it spills into your eyes, you need to immediately move to the _____ ___eye wash___ station and begin ___rinse____ your eyes. If you spill the chemical all over your clothes, you need to move to the _emergency shower__ and begin rinsing your clothes and yourself.

If a chemical spill occurs, but is contained to the tabletop, you need to step back and call the teacher over. Wait for instructions from the teacher on how to clean up. If glass is broken, additional care is needed.

In Case of Broken Glass

If you break any of the glassware we are using, you must let the teacher know, and begin clean-up. If the glassware was empty, you may begin clean-up using a broom to sweep up all of the glass into a dust pan. The contents can then be placed in a glass waste container. If there were any chemicals or other contents involved, you must ask your teacher what to do before beginning to clean up.

Disposal of Chemicals

Disposal of Unused Chemicals

You must **_NEVER_ put unused chemicals back** into their original containers. If you have taken too much of a chemical, you may ask your peers if they need some, or ask your teacher for ____disposal_____ instructions. This is because the chemical may be ____contaminated__ by using glassware that was not perfectly clean and dry, or it may be placed in an incorrect container by accident – which may lead to a ___reaction___ occurring, or changing the composition of the contents of the container.

Disposal of Used Chemicals

You will be given instructions as to how to dispose of chemicals used in each experiment. Some chemicals may be safe to drain down the sink while others may not be.

Protective Equipment

Safety Goggles

Safety goggles MUST be worn whenever chemicals or glassware are being used. Goggles must be on BEFORE handling chemicals or glassware, and cannot be removed until you have disposed and put away all chemicals and glassware. In our lab, we will wear our goggles the __entire_ duration that we are in there unless the teacher says otherwise.

Fume Hoods

What is a fume hood?

A fume hood is similar to the __range__ that is used when cooking. It is used to dispose of the __gases_____ and odd ___odors___ that are produced when chemical reactions occur. Any time that toxic gases are produced, we will use the fume hood.

How do you use a fume hood?

A fume hood needs to be turned on before you start your experiment. When performing your experiment, the glass window should be _lowered enough that you can perform your experiment _safely_. When you are not working in the fume hood, you may pull the glass window down. This is because the fume hood creates a vacuum that is strong enough to ventilate all odors and gases even with the glass windows open. If your reaction begins to spatter uncontrollably, however, you may wish to pull the glass down and wait for the reaction to settle.

Laboratory Hazards

Hazard	Nature Of Hazard	How to Deal with Hazard
Spilled Chemicals	Another student touching it	Notify teacher for chemical cleanup instruction, "close" the area off while waiting.
Broken Glass	cuts Chemical contamination	Notify the teacher for chemical instructions if chemicals are mixed with the glass. If no chemicals are involved, clean up glass with dust pan and broom and place in glass disposal.
Burning Chemicals in a container	gases Get burnt spatter	Step back and notify class. Deal with fire as described by "In case of fire" protocol above.
Chemicals on hands	burn Could be fatal Allergic reaction	Wash off immediately under fast-running water. Use a neutralizing solution if the chemicals are acidic or basic in nature – or if the chemical properties are unknown.
Being asked to smell chemical vapours	Knocked out nauseous burnt Very strong smells	Holding the container in front of you, **waft** the odour to you. Never smell directly. If you have an allergic reaction, immediately let the teacher know.
Bunsen Burners	fire Person or property	Tie long hair back when using Bunsen burner. Do not keep the burner gas on if your burner won't start, this will prevent the room from being filled with flammable gas.
Loose hair or clothing/accessories	fire chemicals tripping	Tie long hair back, remove or tuck-in any jewelry and ties. Remove baggy clothing, and ensure closed-toe shoes are worn during laboratory experiments.

Lab Safety Name: _____ Date: _____

Hazard Symbols

WHMIS Symbols

What does WHMIS stand for?

_____workplace hazardous materials information system_____

_____

What is WHMIS?

- A method of ensuring everyone has access to safety information about any substance that they may encounter
- There are 10 WHMIS symbols, shown below

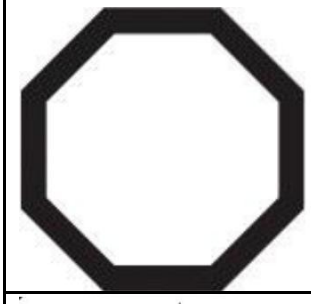
Below are the WHMIS symbols according to the 2015 standards. Keep an eye out for these symbols on some of your household products and in the lab.

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)
	**Biohazardous Infectious Materials** (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

Other Safety Symbols

More Safety symbols include the ones listed below. These are symbols commonly found on household products.

Symbol	Meaning	Symbol	Meaning
	Dangerous **Container** – handle container with care, do not drop, etc.		**Corrosive** – wear gloves and goggles, wear a face mask if necessary, ensure arms are covered with sleeves, closed-toe shoes, etc.
	Dangerous **Contents** – handle contents with care		**Explosive** – Handle with care, keep away from heat, flames, and sparks, store in a safe place
	**Flammable** – keep away from heat, flames, and sparks, store in a safe spot		**Poisonous** – wear gloves, wash hands, do not breathe in, etc.