

MODULE 3: Communication and Terminology for the Workplace

TOPIC 5: Health and Safety – WHMIS

LEARNING OUTCOMES:

By the end of this topic, participants will be able to:

- ◆ recognize and explain WHMIS symbols
- ◆ explain safety procedures for at least one hazardous material
- ◆ participate as part of a team in the development of a short WHMIS presentation

TOPIC	SKILLS	CLB COMPETENCE AREA	COMPETENCIES	PRE-TASKS	TASK	POST-TASK
<ul style="list-style-type: none"> ◆ Health and Safety – WHMIS 	<ul style="list-style-type: none"> ◆ Reading ◆ Writing ◆ Speaking/ Listening 	<ul style="list-style-type: none"> ◆ formatted text ◆ unformatted text ◆ exchanging information 	<ul style="list-style-type: none"> ◆ understand WHMIS labels ◆ describe workplace safety procedures ◆ give a presentation on health and safety ◆ apply prior knowledge of health and safety in a Canadian context 	<ul style="list-style-type: none"> ◆ listen to a short presentation on WHMIS by facilitator ◆ match WHMIS labels with titles ◆ explain dangers of WHMIS designated hazardous material 	<ul style="list-style-type: none"> ◆ prepare a presentation (simulating workplace training on WHMIS) 	<ul style="list-style-type: none"> ◆ read MSDS

Facilitator's Guide for Module 3

Topic 5: Health and Safety – WHMIS

FACILITATOR PREPARATION

Content

Topics 5 and 6 of this module deal with health and safety issues. Health and safety is an important aspect of the Canadian workplace for engineers. Topic 5 is a lesson on WHMIS (the Workplace Hazardous Materials Information System). Topic 6 focuses on health and safety issues more specific to engineers. Due to time constraints, the facilitator may decide to present only one of the two lessons.

In order to prepare for this lesson, the facilitator should be familiar with WHMIS. Basic information about WHMIS is provided in the Facilitator's Notes. Additional information about WHMIS can be obtained from Health Canada's WHMIS Web site: <http://www.hc-sc.gc.ca/hecs-sesc/whmis/index.htm>.

The lesson focuses on eight WHMIS symbols, the workplace hazards they represent, and associated safety procedures. The post-task includes the MSDS (Material Safety Data Sheet), which can be assigned as an optional take-home reading task. The content and terminology of the lesson provide a thematic basis for practising communication skills including group decision-making, task negotiation, and making an oral presentation.

Delivery

Make as many copies as necessary of the following:

- ◆ Handout 1 WHMIS symbols
- ◆ Handout 2 Terms for Hazardous Material
- ◆ Handout 3 Instructions for Task
- ◆ Handout 4, 4A - 7, 7A The members of each of four groups should get Handout 4 and 4A, 5 and 5A, 6 and 6A or 7 and 7A.
- ◆ Handout 8 Reading Hazard Labels
- ◆ Handout 9 Material Safety Data Sheet (MSDS) – two pages

Materials needed: chart paper, markers, OHP, OHT 1

Methodology

Introduction

- (10 minutes)** 1. Write the words Occupational Health and Safety Act on the board and encourage participants to brainstorm words associated with this phrase. Some terms/words that should be raised are: protection, danger, law, hazardous waste, safety rules.

Pre-Tasks

- (20 minutes)** 1. Explain that this lesson will focus on health and safety and Canadian and Ontario law, particularly one piece of legislation.

Explain that Canada places more emphasis on health and safety than any other country.

At the provincial level, there are two health and safety laws:

- ◆ The Occupational Health and Safety Act
- ◆ The WHMIS Regulation

Explain that the goal of today's lesson is to become familiar with WHMIS, which stands for the Workplace Hazardous Materials Information System. All businesses and workplaces are legally required to conform to WHMIS regulations.

WHMIS is designed to give employers and employees information about hazardous materials in the workplace. It is based on three approaches:

- ◆ Container labelling
- ◆ MSDS – Material Safety Data Sheet
- ◆ Workplace education programs

The purpose of WHMIS is to reduce accidents, reduce disease, and encourage workplace education on health and safety. Explain that labour, industry, and all three levels of governments (federal, provincial, and municipal) participated in the development of this legislation.

Explain that each employee must understand the dangers in their workplace and be familiar with WHMIS. In addition, employees should be able to explain dangers and safety rules to others.

(20 minutes) 2.

The first part of WHMIS consists of symbols representing various workplace hazards. Show OHT1 and ask if they know or can guess what the symbols mean. Distribute Handout 1 and 2 and have the participants work with a partner and match the label with the symbol. Take up as a whole-class activity and have the participants explain the danger (see Facilitator's Answer Sheet). Explain also that each hazardous material is classified A-F.

Explain that the task for the day is to prepare and present a short presentation on two symbols of WHMIS.

(45 minutes) 3.

Divide the class into groups of four. Distribute Handout 3. Go over the instructions for the task with the class. Explain that workplace safety training is an important part of workplace communication. Each group is responsible for a short class presentation on the dangers represented by two symbols. Their task is to explain the dangers and the safety rules that should be followed when working around these materials. Each group will be given two WHMIS symbols and chart paper in order to create a visual aid to be used during their presentation (Handouts 4, 4A, 5, 5A, 6, 6A, 7, 7A). Explain that this task involves teamwork. All team members should work together to complete the task. Groups can elect one of their

members to be a notetaker and another to be the speaker. Explain to the class that they should work together first and share knowledge that they have gained through prior work experience. After 10 minutes, distribute the corresponding WHMIS information (Handouts 4A, 5A, 6A and 7A) and have the participants include the information, if they haven't already. Remind them that their visual aid is an important part of their presentation.

Task

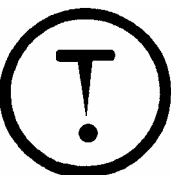
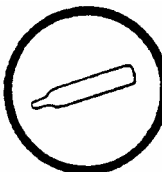
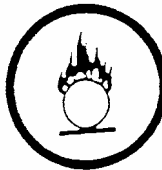
- (35 minutes)** 1. Have each group present their WHMIS symbols to the class. Set the scene by stating that the participants listening are really employees in a workplace WHMIS training session. Allow and encourage clarification questions.

Distribute Handout 8 with the information summary following the presentations.

Post-Task

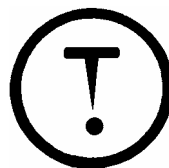
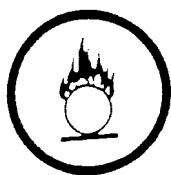
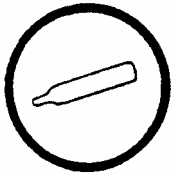
- (20 minutes)** 1, Distribute Handouts 9 and 9A. Explain that WHMIS training also includes being able to read information about hazardous materials on labels and supplier information. All workplaces must also complete a MSDS (Material Safety Data Sheet). This information is highly technical and detailed. Perhaps some chemical engineers would be interested in sharing their knowledge. Encourage brief discussion on any information that is raised.

OHT 1



Source: *WHMIS Handbook*.

Handout 1



Source: *WHMIS Handbook*.

Handout 2

Bio-hazardous Poisonous and Infectious Material

Dangerously Reactive Material

Poisonous and Infectious Material: Immediate and Serious Toxic Effects

Poisonous and Infectious Material: Other Toxic Effects

Oxidizing Material

Corrosive Material

Compressed Gas

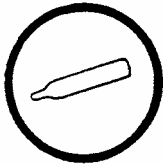
Flammable and Combustible Material

FACILITATOR'S NOTES

Answer Sheet

Compressed Gas

- ◆ *Can explode*



Poisonous and Infectious Material - Biohazardous

- ◆ *May cause a serious disease causing death or illness*



Flammable and combustible material

- ◆ *Will burn very easily*



Dangerously Reactive Material

- ◆ *May explode if the container is dropped or heated or if the material is mixed with other chemicals*



Corrosive material

- ◆ *Can seriously burn your eyes or skin*



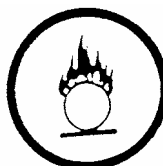
Poisonous and Infectious Material: Immediate and serious toxic effects

- ◆ *potentially fatal*



Oxidizing Material

- ◆ *Feeds oxygen to a fire and makes it larger*



Poisonous and Infectious Material: Other Toxic Effects

- ◆ *May cause serious disease over time*



Handout 3

TASK

Your group has been given these WHMIS symbols to present to the rest of the class.

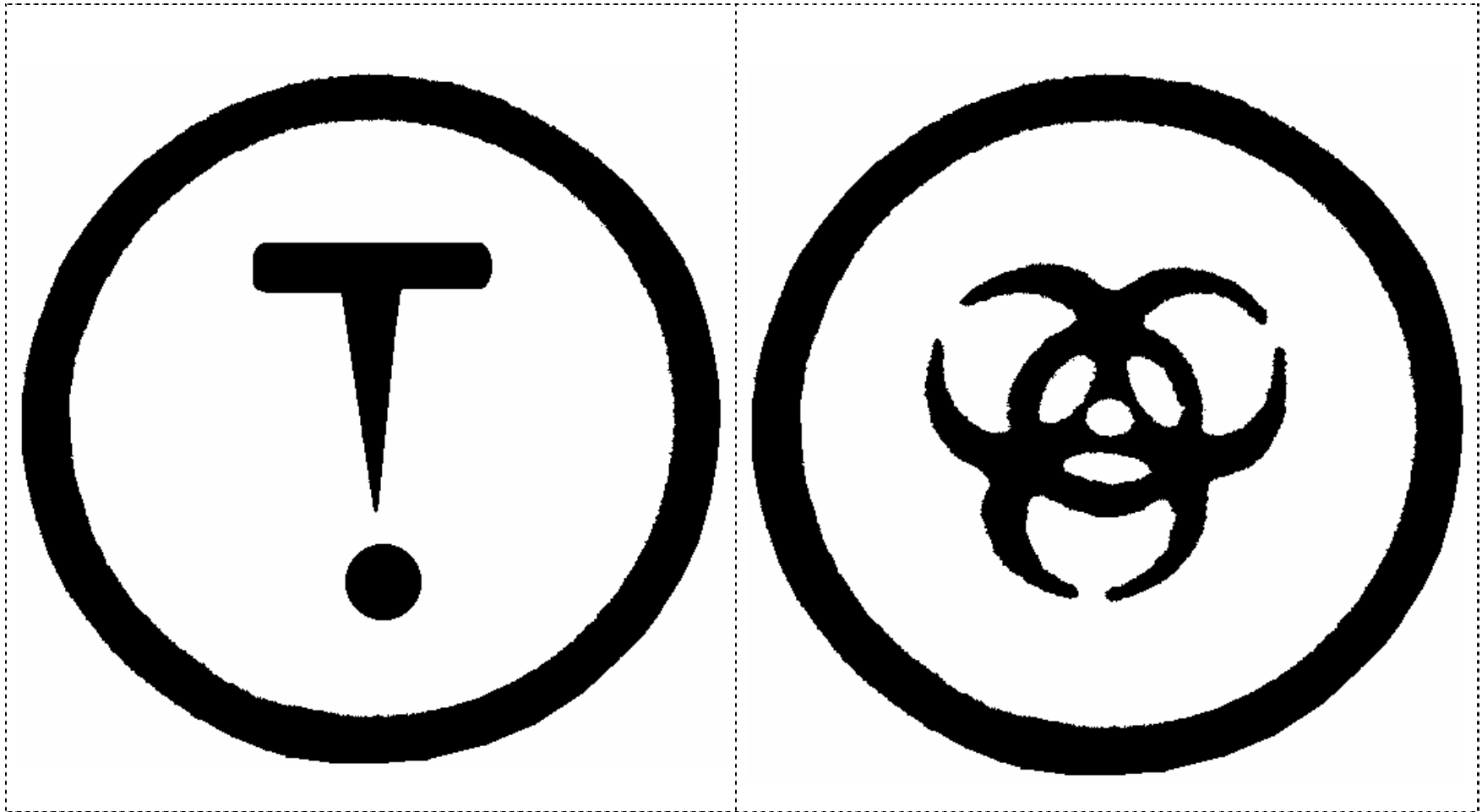
Imagine that you are presenting this information to a group of employees as part of their WHMIS workplace training.

You have to prepare a visual aid, and explain the dangers represented by this symbol (with examples, if possible) and the safety rules that should be followed (the Do's and Don'ts)

Follow these steps:

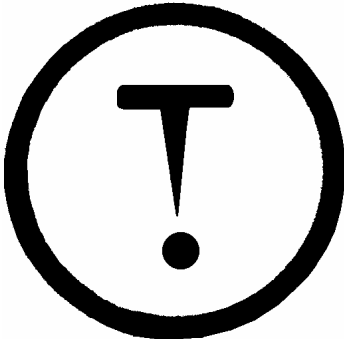

1. Determine who will be the speaker and the writer in the group.
2. Use the information from class and your own knowledge from prior work experience and training to explain the dangers and safety rules that should be followed.
3. Use the information sheet to add new information.
4. Prepare a visual aid.
5. Use the visual aid to present the information to the class.

Handout 4



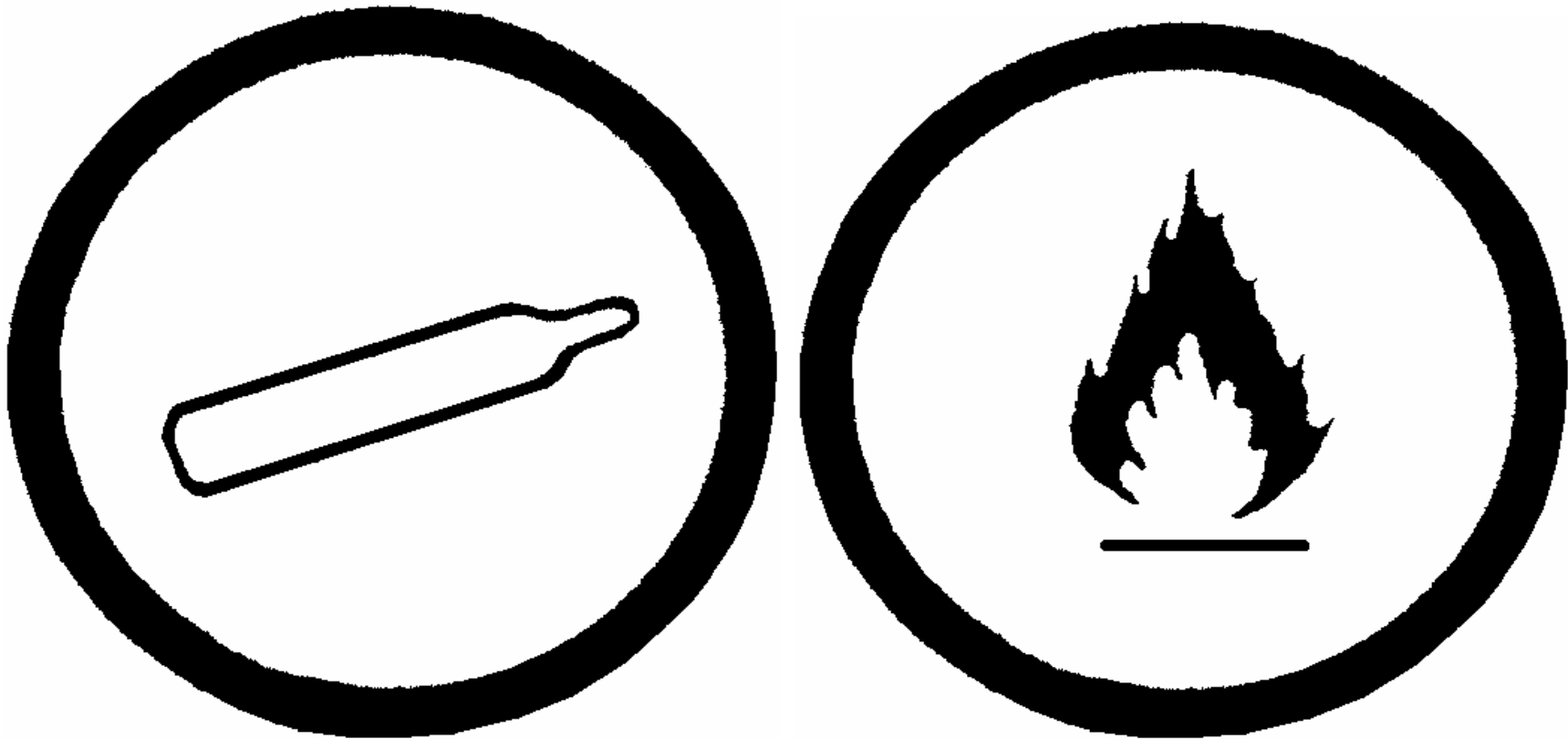
Source: WHMIS Handbook.

Handout 4A

How to read label hazard symbols		
The symbol represents . . .	It means that the material . . .	And that you should . . .
 <p>Class D, Division 2 – Poisonous and infectious material other toxic effects</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is a poisonous substance that is not immediately dangerous to health <input type="checkbox"/> may cause death or permanent damage as a result of repeated exposures over time <input type="checkbox"/> may be a skin or eye irritant <input type="checkbox"/> may be a sensitizer, which produces a chemical allergy <input type="checkbox"/> may cause cancer <input type="checkbox"/> may cause birth defects or sterility 	<ul style="list-style-type: none"> <input type="checkbox"/> avoid skin and eye contact by wearing all protective equipment necessary, including eye, face, and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment as designated by your supervisor <input type="checkbox"/> store the material in designated places only
 <p>Class D, Division 3 – Poisonous and infectious material: biohazardous infectious material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> may cause a serious disease resulting in illness or death 	<ul style="list-style-type: none"> <input type="checkbox"/> take every measure to avoid contamination <input type="checkbox"/> handle the material only when fully protected by the proper, designated equipment <input type="checkbox"/> handle the material in designated areas where engineering controls are in place to prevent exposure

Source: *WHMIS Handbook*.

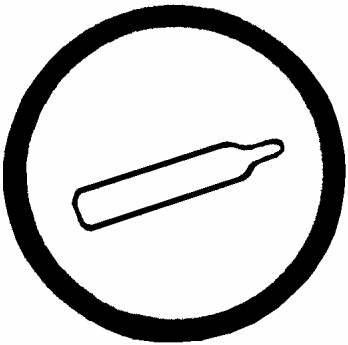

Handout 5



Source: WHMIS Handbook.

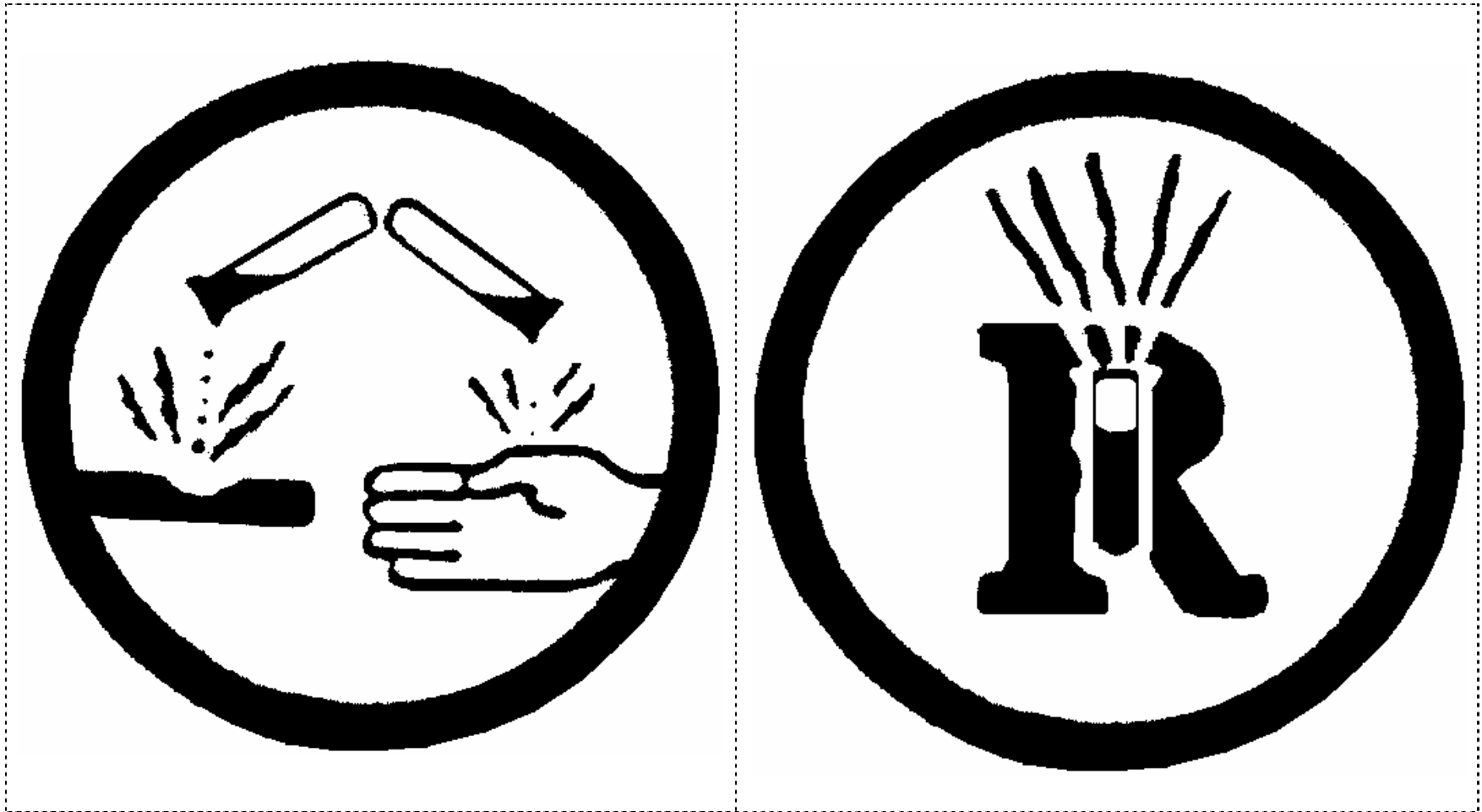
Module 3: Communication and Terminology in the Workplace
Topic 5: Health and Safety – WHMIS

Handout 5A

How to read label hazard symbols		
The symbol represents . . .	It means that the material . . .	And that you should . . .
 <p>Class A – Compressed gas</p>	<ul style="list-style-type: none"> ❑ poses an explosion danger because the gas is being held in a cylinder under pressure ❑ may cause its container to explode if heated in a fire ❑ may cause container to explode if dropped 	<ul style="list-style-type: none"> ❑ handle with care; do not drop cylinder ❑ keep cylinder away from potential sources of ignition ❑ store the containers in the area designated by your supervisor
 <p>Class B – Combustible and flammable material</p>	<ul style="list-style-type: none"> ❑ is one that will burn and is therefore a potential fire hazard ❑ may burn at relatively low temperatures; flammable materials catch fire at lower temperatures than combustible materials ❑ may burst into flame spontaneously in air or release a flammable gas on contact with water ❑ may cause a fire when exposed to heat, sparks, or flames or as a result of friction 	<ul style="list-style-type: none"> ❑ keep the material away from heat sources and other combustible materials ❑ never smoke when working with or near the material ❑ store the material in a cool, fire-proof area, as designated by your supervisor



Source: *WHMIS Handbook*.

Handout 6



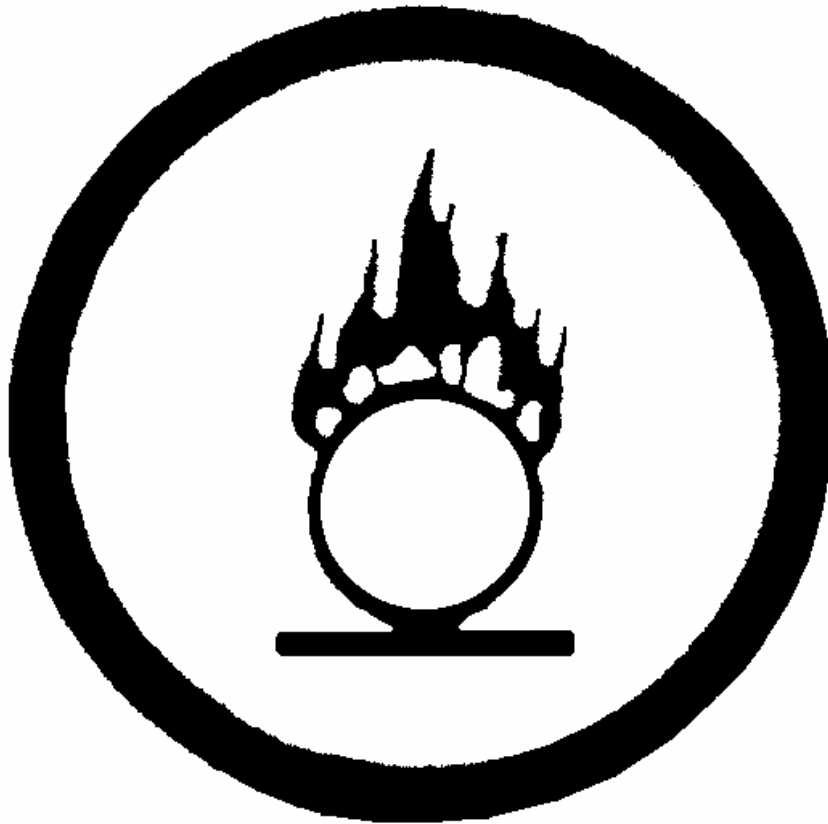
Source: *WHMIS Handbook*.

Handout 6A

How to read label hazard symbols		
The symbol represents . . .	It means that the material . . .	And that you should . . .
 <p>Class E – Corrosive material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> causes severe eye and skin irritation upon contact <input type="checkbox"/> causes severe tissue damage with prolonged contact <input type="checkbox"/> may be harmful if inhaled 	<ul style="list-style-type: none"> <input type="checkbox"/> keep containers tightly closed <input type="checkbox"/> avoid skin and eye contact by wearing all necessary protective equipment, including eye, face and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by using in well-ventilated areas only and/or wearing the proper respiratory equipment, as designated by your supervisor
 <p>Class F – Dangerously reactive material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is very unstable <input type="checkbox"/> may react with water to release a toxic or flammable gas <input type="checkbox"/> may explode as a result of shock, friction or increase in temperature <input type="checkbox"/> may explode if heated when in a closed container <input type="checkbox"/> undergoes vigorous polymerization 	<ul style="list-style-type: none"> <input type="checkbox"/> keep material away from heat <input type="checkbox"/> open containers carefully; do not drop them <input type="checkbox"/> store the material in a cool, flame-proof area, as designated by your supervisor



Source: WHMIS Handbook.

Handout 7





Source: *WHMIS Handbook*.

Handout 7A

How to read label hazard symbols		
The symbol represents . . .	It means that the material . . .	And that you should . . .
 <p>Class C – Oxidizing material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> poses a fire and/or explosion risk in the presence of flammable or combustible material <input type="checkbox"/> may cause fire when it comes into contact with combustible materials such as wood <input type="checkbox"/> may react violently or cause an explosion when it comes into contact with combustible materials such as fuels <input type="checkbox"/> may burn skin and eyes upon contact 	<ul style="list-style-type: none"> <input type="checkbox"/> keep the material away from combustible materials and store in the areas designated by your supervisor <input type="checkbox"/> keep the material away from sources of ignition <input type="checkbox"/> never smoke when working near the material <input type="checkbox"/> wear the proper protective equipment, including eye, face, and hand protection and protective clothing
 <p>Class D, Division 1 – Poisonous and infectious material: immediate and serious toxic effects</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is a potentially fatal poisonous substance <input type="checkbox"/> may be fatal or cause permanent damage if it is inhaled or swallowed or if it enters the body through skin contact <input type="checkbox"/> may burn eyes or skin upon contact 	<ul style="list-style-type: none"> <input type="checkbox"/> keep material away from heat <input type="checkbox"/> handle the material with extreme caution <input type="checkbox"/> avoid contact with the skin or eyes by wearing the proper protective equipment, including eye, face, and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment <input type="checkbox"/> wash and shower thoroughly after using <input type="checkbox"/> store the material in designated areas only

Source: *WHMIS Handbook*.

Handout 8

How to read label hazard symbols		
 <p>Class A – Compressed gas</p>	<ul style="list-style-type: none"> <input type="checkbox"/> poses an explosion danger because the gas is being held in a cylinder under pressure <input type="checkbox"/> may cause its container to explode if dropped 	<ul style="list-style-type: none"> <input type="checkbox"/> handle with care: do not drop cylinder <input type="checkbox"/> keep cylinder away from potential sources of ignition <input type="checkbox"/> store the containers in the area designated by your supervisor
 <p>Class B - Combustible and flammable material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is one that will burn and is therefore a potential fire hazard <input type="checkbox"/> may burn at relatively low temperatures; flammable materials catch fire at lower temperatures than combustible materials <input type="checkbox"/> may burst into flame spontaneously in air or release a flammable gas on contact with water <input type="checkbox"/> may cause a fire when exposed to heat, sparks, or flames or as a result of friction 	<ul style="list-style-type: none"> <input type="checkbox"/> keep the material away from heat sources and other combustible materials <input type="checkbox"/> never smoke when working with or near the material <input type="checkbox"/> store the material in a cool, fire-proof area, as designated by your supervisor
 <p>Class C – Oxidizing material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> poses a fire and/or explosion risk in the presence of flammable or combustible material <input type="checkbox"/> may cause fire when it comes into contact with combustible materials such as wood <input type="checkbox"/> may react violently or cause an explosion when it comes into contact with combustible materials such as fuels <input type="checkbox"/> may burn skin and eyes upon contact 	<ul style="list-style-type: none"> <input type="checkbox"/> keep the material away from combustible materials and store in the areas designated by your supervisor <input type="checkbox"/> keep the material away from sources of ignition <input type="checkbox"/> never smoke when working near the material <input type="checkbox"/> wear the proper protective equipment, including eye, face and hand protection and protective clothing
 <p>Class D, Division 1 – Poisonous and infectious material: immediate and serious toxic effects</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is a potentially fatal poisonous substance <input type="checkbox"/> may be fatal or cause permanent damage if it is inhaled or swallowed or if it enters the body through skin contact <input type="checkbox"/> may burn eyes or skin upon contact 	<ul style="list-style-type: none"> <input type="checkbox"/> Handle the material with extreme caution <input type="checkbox"/> avoid contact with the skin or eyes by wearing the proper protective equipment, including eye, face and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by working in well-ventilated area and/or wearing respiratory equipment <input type="checkbox"/> wash and shower thoroughly after using <input type="checkbox"/> store the material in designated areas only
 <p>Class D, Division 2 – Poisonous and infectious material: other toxic effects</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is a poisonous substance that is not immediately dangerous to health <input type="checkbox"/> may cause death or permanent damage as a result of repeated exposure over time <input type="checkbox"/> may be a skin or eye irritant <input type="checkbox"/> may be a sensitizer, which produces a chemical allergy <input type="checkbox"/> may cause cancer <input type="checkbox"/> may cause birth defects or sterility 	<ul style="list-style-type: none"> <input type="checkbox"/> avoid skin and eye contact by wearing all protective equipment necessary, including eye, face, and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment as designated by your supervisor <input type="checkbox"/> store the material in designated places only
 <p>Class D, Division 3 – Poisonous and infectious material: biohazardous infectious material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> may cause a serious disease resulting in illness or death 	<ul style="list-style-type: none"> <input type="checkbox"/> take every measure to avoid contamination <input type="checkbox"/> handle the material only when fully protected by the proper, designated areas where engineering controls are in place to prevent exposure
 <p>Class E - Corrosive material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> causes severe eye and skin irritation upon contact <input type="checkbox"/> causes severe tissue damage with prolonged contact <input type="checkbox"/> may be harmful if inhaled 	<ul style="list-style-type: none"> <input type="checkbox"/> keep containers tightly closed <input type="checkbox"/> avoid skin and eye contact by wearing all necessary protective equipment, including eye, face and hand protection and protective clothing <input type="checkbox"/> avoid inhaling by using in well-ventilated areas only and/or wearing the proper respiratory equipment, as designated by your supervisor
 <p>Class F - Dangerously reactive material</p>	<ul style="list-style-type: none"> <input type="checkbox"/> is very unstable <input type="checkbox"/> may react with water to release a toxic or flammable gas <input type="checkbox"/> may explode as a result of shock, friction or increase in temperature <input type="checkbox"/> may explode if heated when in a closed container <input type="checkbox"/> undergoes vigorous polymerization 	<ul style="list-style-type: none"> <input type="checkbox"/> keep material away from heat <input type="checkbox"/> open containers carefully; do not drop them <input type="checkbox"/> store the material in a cool, flame-proof area, as designated by your supervisor

(Source: WHMIS Handbook)

Handout 9 (Page 2 of 2)

PRODUCT IDENTIFIER			
Section 6 – Reactivity data			
Chemical stability		If no, under which conditions? ➡	
Yes <input type="checkbox"/> No <input type="checkbox"/>			
Chemical stability with other substances			
Yes <input type="checkbox"/> No <input type="checkbox"/> If so, which one? ➡			
Reactivity, and under what conditions			
Hazardous decomposition products			
Section 7 – Toxicological properties			
Route of entry: Skin contact <input type="checkbox"/> Skin absorption <input type="checkbox"/> Eye contact <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/>			
Effects of acute exposure to product _____			
Effects of acute exposure to product _____			
Exposure limits	Irritancy of product	Sensitization to product	Carcinogenicity
Reproductive toxicity	Teratogenicity	Mutagenicity	Synergistic products
Section 8 – Preventative Measures			
Personal protective equipment			
Gloves (specify)	Respiratory (specify)		Eye (specify)
Footwear (specify)	Clothing (specify)	Other (specify)	
Engineering controls (specify, EG. Ventilation, enclosed process)			
Leaks & spills procedure			
Waste disposal			
Handling procedures & equipment			
Storage requirements			
Special shipping information			
Section 9 – first and measures			
Special shipping information			

Source: WHMIS and Trafalgar Square, 1997 CWP WHMIS Training Package.

Terminology List

WHMIS Symbols

- ◆ Biohazardous Poisonous and Infectious Material
- ◆ Dangerously Reactive Material
- ◆ Poisonous and Infectious Material: Immediate and Serious Toxic Effects
- ◆ Poisonous and Infectious Material: Other Toxic Effects
- ◆ Oxidizing Material
- ◆ Corrosive Material
- ◆ Compressed Gas
- ◆ Flammable and Combustible Material