# SCIENCE LAB SAFETY TRAINING

JACKSON COUNTY CENTRAL SCHOOLS



#### EMPLOYEE RIGHT-TO-KNOW

- MINNESOTA'S VERSION OF OSHA HAZARD COMMUNICATION
- EMPLOYEE RIGHT-TO-KNOW ACT AND PROGRAM REQUIRES EMPLOYERS TO MAKE EMPLOYEES AWARE OF HAZARDOUS SUBSTANCES THAT MAY BE ENCOUNTERED AT WORK:
  - HAZARDOUS SUBSTANCES
  - CHEMICALS
  - PHYSICAL AGENTS
  - INFECTIOUS AGENTS
- THE DISTRICT HAS A WRITTEN ERK PROGRAM.



#### PICTOGRAMS

	Exploding bomb (for explosion or reactivity hazards)		Flame (for fire hazards)		Flame over circle (for oxidizing hazards)
$\diamond$	Gas cylinder (for gases under pressure)	R.	<b>Corrosion</b> (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*)	¥2	Environment* (may cause damage to the aquatic environment)
$\textcircled{\black}{\black}$	Biohazardous Infect (for organisms or tox	tious Materials	eases in people or anima	als)	

 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. PICTOGRAMS ARE USED TO PROVIDE A USER WITH IMMEDIATE, EASY-TO-READ AND EASY TO UNDERSTAND INFORMATION, ABOUT HAZARDS THE CHEMICAL MAY PRESENT.

THERE ARE 9 STANDARD PICTOGRAMS.

#### LABELING REQUIREMENTS

CHEMICAL LABELS MUST HAVE THE FOLLOWING INFORMATION:

- PRODUCT IDENTIFIER
- PICTOGRAM
- SIGNAL WORDS "DANGER" OR "WARNING"
- HAZARD STATEMENTS
  - STANDARD PHRASES ASSIGNED TO A
    HAZARD CLASS AND CATEGORY
- PRECAUTIONARY STATEMENTS
- SUPPLIER INFORMATION



#### **The Basic Parts of A GHS-Compliant Label**

n-Propyl Alcohol

UN No. 1274 CAS No. 71-23-8

## DANGER

Highly flammable liquid and vapor. Causes serious eye damage. May cause drowsiness and dizziness.

->

Keep away from heat/sparks/open flames/hot surfaces. No smoking. Avoid breathing fumes/mist/vapours/spray. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present. Continue rinsing.

Fill Weight: 18.65 lbs. Gross Weight: 20 lbs. Expiration Date: 6/21/2020

Lot Number: B56754434 Fill Date: 6/21/2013

See SDS for further information.

Acme Chemical Company • 711 Roadrunner St. • Chicago, IL 60601 USA • www.acmechem.com • 123-444-5567





## SECONDARY CONTAINER EXEMPTIONS

WHEN THE CONTAINER MEETS THE FOLLOWING CRITERIA, YOU DO NOT NEED TO HAVE THE FULL LABEL...

- THE CHEMICAL WILL BE USED ONLY BY THE PERSON WHO TRANSFERS IT FROM THE LABELED CONTAINER.
- IT WILL BE UNDER THE CONTROL OF THE SAME PERSON.
- THE CHEMICAL IN THE CONTAINER IS GOING TO BE USED DURING THE WORK-SHIFT.

#### NOTE THAT THE PRODUCT MUST STILL BE IDENTIFIABLE!



- SDSS LIST ALL INFORMATION ABOUT A PRODUCT, SUCH AS THE APPROPRIATE PPE TO WEAR WHEN USING A CHEMICAL OR WHAT TO DO IF IT ENTERS YOUR EYE.
- CAN AND SHOULD BE USED IN AN EMERGENCY, PRIOR TO USE, OR FOR RESEARCH
- PREVIOUSLY REFERRED TO AS MATERIAL SAFETY DATA SHEETS
- CHEMICAL INVENTORIES AND SDS ARE LOCATED IN EACH DEPARTMENT.

# SDS FORMAT

- 1. PRODUCT IDENTIFICATION
- 2. HAZARD IDENTIFICATION
- 3. COMPOSITION INFORMATION 11. TOXICOLOGICAL
- 4. FIRST AID MEASURES
- 5. FIREFIGHTING MEASURES
- 6. ACCIDENTAL RELEASE MEASURES
- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROL/PPE
- 9. PHYSICAL AND CHEMICAL

#### PROPERTIES

- 10. STABILITY AND REACTIVITY
- N11. TOXICOLOGICAL INFORMATION
- 12. ECOLOGICAL INFORMATION
- 13. DISPOSAL CONSIDERATION
- 14. TRANSPORTATION INFORMATION
- 15. REGULATORY INFORMATION
- 16. OTHER INFORMATION

![](_page_7_Picture_18.jpeg)

![](_page_7_Picture_19.jpeg)

![](_page_8_Picture_0.jpeg)

# HAZ COM/ RIGHT-TO-KNOW CONTROLLING RISK

![](_page_8_Figure_2.jpeg)

Least effective

Most effective

## PERSONAL PROTECTIVE EQUIPMENT (PPE)

![](_page_9_Picture_1.jpeg)

- WHY PPE?
  - IT IS THE LAST LINE OF DEFENSE BETWEEN YOU AND THE HAZARDOUS CHEMICAL.
- WHAT TYPES ARE AVAILABLE?
  - GOGGLES
  - GLOVES
  - APRONS
- INSTRUCT STUDENTS ON PURPOSE AND PROPER USE
- LEAD BY EXAMPLE

![](_page_9_Picture_10.jpeg)

![](_page_10_Figure_0.jpeg)

#### Eye Protection

Wear when working with hazardous substances that require eye protection.

#### Protective Clothing

Clothing that offers against splashes, spills, and be non-flammable equipped with snap fasteners

![](_page_11_Picture_4.jpeg)

Respiratory Protection Employees required to wear respirators or voluntarily wearing respirators must participate in the district's Respiratory Protection Program (RPP)

# PERSONAL PROTECTIVE EQUIPMENT (PPE)

![](_page_12_Picture_0.jpeg)

- AS A LAB EMPLOYEE YOU ARE REQUIRED TO BE PROVIDED WITH A S COPY OF THE LAB SAFETY STANDARD. A LINK TO THAT IS BELOW:
  - <u>HTTPS://WWW.OSHA.GOV/LAWS-</u> <u>REGS/REGULATIONS/STANDARDNUMBER/1910/1910.1450</u>

![](_page_13_Picture_0.jpeg)

![](_page_13_Picture_1.jpeg)

The Chemical Hygiene Officer:

Liaison between staff and administration

¥= \*

Ensures proper work practices and procedures

Responsible for lab safety inspections, development of
 SOPs, and communication distribution

![](_page_13_Picture_7.jpeg)

Knowledge of proper waste disposal

#### WRITTEN CHEMICAL HYGIENE MANAGEMENT PLAN

#### Located with District Health & Safety Files

#### Plan Includes:

- Employee responsibilities
- CHO responsibilities
- Lab facility design and maintenance
- Standard Operating Procedures (SOPs)
- Personal Protective Equipment (PPE)
- Emergency response plans
- Employee exposure determination
- Recordkeeping
- Training requirements
- Hazardous waste/disposal procedures

## BASIC RULES AND PROCEDURES

- AVOIDANCE OF EXPOSURE ENCOURAGE SAFE HABITATS IN THE WORKPLACE
  - SUCH AS: DO NOT SMELL, TASTE, SIPHON, DRINK OR EAT, OR EVEN STORE FOOD, AROUND THE CHEMICALS.

> NO HORSEPLAY

- CLOTHING/JEWELRY LOOSE CLOTHING, HAIR, AND JEWELRY MUST BE CONFINED OR TUCKED IN TO CREATE LESS EXPOSURE TO CHEMICALS.
- GLASSWARE HANDLE CAREFULLY TO KEEP FROM DAMAGING OR BREAKING AND CREATING AN EXPOSURE

![](_page_15_Picture_6.jpeg)

## DISTRIBUTION AND TRANSFER

#### STORAGE

THE DISTRICT PERMITS AS LITTLE CHEMICAL STORAGE AS IS PRACTICAL FOR THE CURRICULUM.

- CHEMICALS ARE STORED ACCORDING TO ESTABLISHED COMPATIBILITY AND SEGREGATION PRINCIPLES.
- NEW BOTTLES OF CHEMICALS ARE DATED AND PROPERLY STORED.
- STORAGE SHELVES HAVE ONE-INCH STOPS INSTALLED ON THE FRONT OF THE SHELF.

#### TRANSFER

- USE TWO HANDS WHEN CARRYING A CHEMICAL CONTAINER.
- THE CONTAINER-WITHIN-A-CONTAINER CONCEPT IS USED WHENEVER MOVING CHEMICAL CONTAINERS A LONG DISTANCE. LARGE CONTAINERS OF CORROSIVES ARE TRANSPORTED FROM CENTRAL STORAGE IN A CHEMICALLY RESISTANT BUCKET OR OTHER CONTAINER DESIGNED FOR THIS PURPOSE.

![](_page_16_Picture_9.jpeg)

#### HEALTH EFFECTS

![](_page_17_Picture_1.jpeg)

#### Acute

Generally manifests quickly (either immediately or within days after an exposure)

![](_page_17_Picture_4.jpeg)

Chronic

Takes longer to develop through repeated exposures

Usually targets certain organs An individual may not be able to sense the exposure

## CHEMICAL EXPOSURE LIMITS

**Permissible Exposure Limit (PEL)** is the maximum amount or concentration of a chemical that a worker may be exposed to under OSHA regulations. <u>The higher the PEL</u> <u>the better!</u>

Threshold Limit Values (TLVs) are guidelines (not standards) that reflect the level of exposure that the typical worker can experience, without an unreasonable risk of disease or injury.

**Time-Weighted Average (TWA)** is an average value of exposure over the course of an 8-hour work shift.

#### **ROUTES OF ENTRY**

![](_page_19_Picture_1.jpeg)

#### DERMAL OR SKIN

- ABSORPTION
- DIRECT CONTACT
- OPEN WOUND

INHALATION

• THROAT AND LUNGS

INGESTION

• MOUTH/GASTROINTESTINAL TRACT

#### CHEMICAL STORAGE

- DESIGNATED STORAGE AREA
- ARRANGEMENT BY FLINN OR OTHER SYSTEM
- ACID AND FLAMMABLE CABINETS
- FIRE EXTINGUISHER
- SMOKE DETECTORS
- <u>HTTPS://WWW.FLINNSCI.COM/API/LIBRARY/DOWNLOA</u>
  <u>D/993B9838C5F54C08B16785B4F9EEF970</u>

![](_page_20_Picture_7.jpeg)

#### CHEMICAL STORAGE

# Shelving

- Avoid storing above eye level
- Minimal storage, small containers

## **Reactive Metals**

- Special storage requirements
- Try to avoid working with these!

Special attention to ...

- Corrosives
- Flammable solvents

![](_page_22_Picture_0.jpeg)

![](_page_22_Picture_1.jpeg)

#### FUME HOODS

- USED WHEN WORKING WITH ODOROUS CHEMICALS (<u>NOT FOR</u> <u>STORAGE</u>)
- PROVIDES PROTECTION AGAINST SPLASHES, BUMPING, AND FUMES
- **NOT** FOR GENERAL STORAGE (EX. TEXTBOOKS, BEAKERS ETC.)
- ENSURE ADEQUATE AIR FLOW
- AVOID DISRUPTIONS TO AIR FLOW
- KEEP CLEAN
- INSPECTED ANNUALLY BY IEA

#### CHEMICAL WASTE AND DISPOSAL INFORMATION

THE DISPOSAL OF HAZARDOUS WASTE IS CONDUCTED ACCORDING TO THE DISTRICT'S MANAGEMENT PLAN FOR HAZARDOUS WASTE. THE CHO MUST WORK WITH THE DISTRICT TO ARRANGE FOR A HAZARDOUS WASTE CHEMICAL PICK-UP.

- THE FOLLOWING RULES APPLY TO DISPOSAL OF HAZARDOUS WASTE:
- CHEMICAL WASTE IS NOT DISPOSED OF DOWN THE SINK UNLESS SPECIFICALLY AUTHORIZED TO DO SO.
- EVAPORATION (I.E., IN A FUME HOOD) IS NOT USED AS A MEANS OF CHEMICAL DISPOSAL.
- NON-COMPATIBLE CHEMICAL WASTES ARE NOT MINGLED.
- CHEMICAL WASTE COLLECTION AND STORAGE CONTAINERS ARE CLEARLY LABELED WITH A DESCRIPTIVE NAME, THE WORDS "HAZARDOUS WASTE," AND THE ACCUMULATION START DATE.
- WASTE MATERIALS ARE DISPOSED OF IN ACCORDANCE WITH APPLICABLE RULES AND REGULATIONS.

![](_page_23_Picture_8.jpeg)

<b>HAZARDOUS</b>
<b>WASTE</b>
FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY GENERATOR INFORMATION: NAME
ADDRESS PHONE
CITY STATE ZIP EPA / MANIFEST ID NO. / DOCUMENT NO
ACCUMULATION START DATEWASTE NO
D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX HANDLE WITH CARE!

## HAZARDOUS WASTE DISPOSAL

- HAZARDOUS WASTES MUST BE LABELED WITH:
  - "HAZARDOUS WASTE"
  - A DESCRIPTIVE NAME (NO CHEMICAL SYMBOLS)
  - THE DATE THE WASTE WAS PLACED INTO THE CONTAINER
- IF YOU HAVE HAZARDOUS WASTE THAT NEEDS TO BE DISPOSED OF, COORDINATE A PICK-UP WITH MARK FROEHLING (FHS CHO). HE COORDINATES A PICK-UP THROUGH THE U OF M PERIODICALLY.

## HAZARDOUS WASTE DISPOSAL

- CHARACTERISTICS OF WASTES
  - IGNITABILITY
  - CORROSIVITY
  - REACTIVITY
  - TOXICITY
- WORK TO REDUCE
  HAZARDOUS WASTE

![](_page_25_Picture_7.jpeg)

## INSPECTIONS – EMERGENCY EYEWASH

- FLUSHED ONCE PER WEEK IF PLUMBED
- INSPECTION ONCE PER MONTH IF PORTABLE
- FLUSHING SHOULD BE DOCUMENTED, AT THE
  STATION ON THE HANGTAG, OR
  - THE DOCUMENTATION LOCATION SHOULD BE
    IDENTIFIED.

![](_page_26_Picture_5.jpeg)

![](_page_26_Picture_6.jpeg)

INSPECTIONS – GENERAL LAB Science Safety Checklists are completed annually by IEA.

An end of year lab close-out checklist will be distributed and collected by the CHO.

Documentation is maintained by the District.

#### EMERGENCY PROCEDURES – CHEMICAL SPILLS

CHEMICAL SPILL PROCEDURES WILL BE POSTED IN EACH CHEMICAL STORAGE AREA.

- ASSESS SPILLS IF CHEMICALS ARE UNKNOWN, EVACUATE THE AREA. CALL EMERGENCY PERSONNEL, IF YOUR SAFETY IS IN DANGER, OR IF THE SPILL IS TOO LARGE TO HANDLE YOURSELF. CONTACT THE FIRE DEPARTMENT IF CONTENTS ARE GREATER THAN ONE (1) GALLON.
- EXTINGUISH ALL SOURCES OF IGNITION IF THE CHEMICAL IS FLAMMABLE AND TURN OFF THE MAIN GAS SHUT-OFF VALVE.
- IMMEDIATELY ATTEND TO SPLASHES IN THE EYES OR ON THE SKIN, BY USING EYEWASH OR SHOWER. DIRECT ANY FIRST AID NEEDS TO THE SCHOOL NURSE.

# EMERGENCY PROCEDURES: CHEMICAL SPILLS

Use	Use	Use	Land
Use appropriate Personal Protective Equipment! • Gloves and goggles can be found in the spill kits.	Use appropriate spill neutralizer from spill kit (acid or base) • Follow instructions on the box.	Use the polypropylene broom and dustpan provided with the neutralizer kit to sweep up materials • Dispose of waste according to hazardous waste rules and regulations.	If there is a release of any substance that may cause pollution to the air, land, or water, report the incident immediately to the: • Minnesota Duty Officer within 24 hours: 651-649- 5451

# ADDITIONAL STANDARD OPERATING PROCEDURES

- STUDENTS ARE NOT PERMITTED TO WORK IN THE
  LAB WITHOUT SUPERVISION.
- SHORTS, SANDALS, AND LOOSE JEWELRY ARE NOT TO BE WORN WHILE USING CHEMICALS.
- EATING AND DRINKING IS NOT ALLOWED IN LABS.
- EXTENSION CORDS ARE NOT TO BE USED AS
  PERMANENT WIRING.
- BROKEN EXTENSION CORDS MUST BE REPLACED (NOT REPAIRED).

![](_page_30_Picture_6.jpeg)

![](_page_31_Picture_0.jpeg)

![](_page_31_Picture_1.jpeg)

## ADDITIONAL SOPS (CONTINUED)

- REFRIGERATORS ARE LABELED FOR CONTENTS (FOOD OR CHEMICAL/BIOLOGICAL).
- CHEMICALS ARE LABELED UPON ARRIVAL WITH PURCHASE DATE.
- EYEWASHES, EMERGENCY SHOWERS, AND FIRE EXTINGUISHERS ARE NOT BLOCKED.
- NO STORAGE IS ALLOWED WITHIN 18 INCHES OF SPRINKLER HEADS.

![](_page_32_Picture_0.jpeg)

![](_page_32_Picture_1.jpeg)

Store by hazard class and according to Safety Data Sheet

![](_page_32_Picture_3.jpeg)

Liquids in secondary containment

![](_page_32_Picture_5.jpeg)

No higher than eye level

![](_page_32_Picture_7.jpeg)

Labeled when received and labeled when opened

# THANK YOU FOR COMPLETING THE EMPLOYEE-RIGHT-TO-KNOW/LAB SAFETY TRAINING

IF YOU HAVE ANY QUESTIONS REGARDING THIS TRAINING OR ANY OTHER HEALTH AND SAFETY TOPIC, PLEASE CONTACT:

CASSIE BOWSER WITH IEA AT 507-382-0364 OR

CASSANDRA.BOWSER@IEASAFETY.COM

Link to the Required Quiz: https://docs.google.com/forms/d/e/1FAIpQLSe3FJuWK1F50BqgQQa2F3Za1gdmS 9PhbQOSJjfErWvA5P\_grg/viewform?usp=sf\_link