EDEN PRAIRIE SCHOOLS

Inspiring each student every day

Science Chemical Hygiene/ ERK Training

Required Quiz

- There is a quiz for this training that must be completed as documentation that you have received the training.
- On the last slide of this presentation there is a link to the quiz.
- If you have any questions, please contact Kyle Fisher, Facilities and Safety Coordinator at 952-975-7000 or by email at Kyle_fisher@edenpr.k12.mn.us

Training Agenda

Lab Safety Standard

Chemical Safety

Personal Protective Equipment

Standard Operating Procedures (SOPs)

Federal Hazard Communication Standard

General Principles of Lab Safety

- Don’t underestimate risk – no matter how long you have been working with chemicals, they can still be dangerous!!!
- Minimize chemical exposures
- Implement and follow a safety program
- Provide a safe working and learning environment
- Continuously improve

Regulations on Lab Safety

- Occupational Exposure to Hazardous Chemicals in Laboratories (OSHA)
- Employee Right-to-Know (OSHA)
- International Fire Code
- National Fire Protection Act
- Local, County, & State HazMat Rules

Written Chemical Hygiene Plan

Includes:

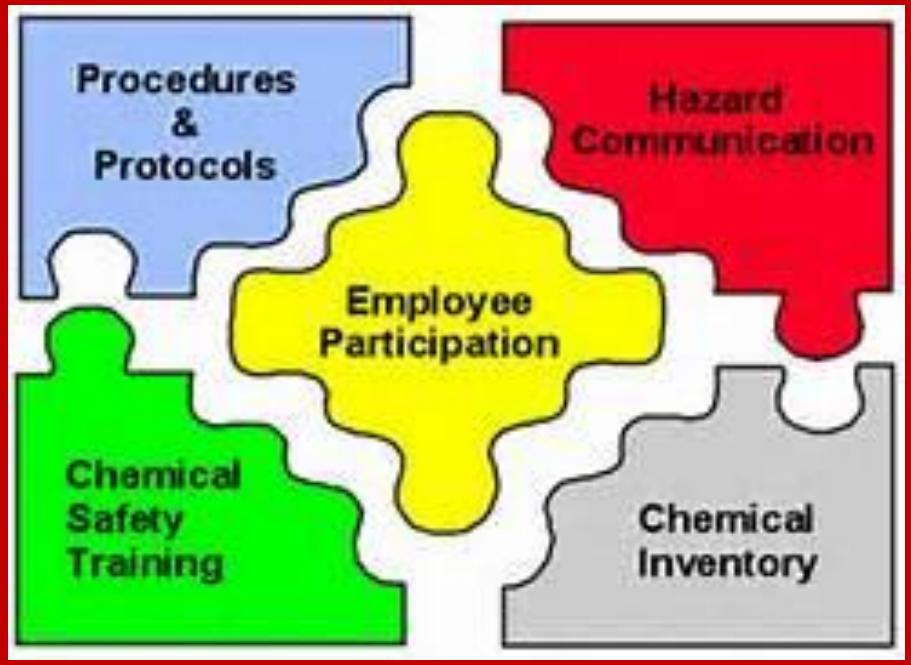
- **Employee responsibilities**
- **Chemical Hygiene Officer (CHO) responsibilities**
- **Lab facility design and maintenance**
- **Standard operating procedures (SOPs)**
- **Personal protective equipment (PPE)**
- **Emergency response plans**
- **Employee exposure determination**
- **Recordkeeping**
- **Training requirements**
- **Hazardous waste/disposal procedures**

Chemical Hygiene Officer (CHO)

- Liaison between staff and administration
- Ensures proper work practices & procedures
- Coordinates lab safety inspections, development of SOPs, and communication distribution
- Knowledge of waste disposal and SDS requirements

Chemical Hygiene Officer (CHO)

The district's Chemical Hygiene Officers are Mike Maas (HS) and Bill Prem (MS).



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. *The higher the PEL, the better.*
- ***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

- Skin and Eyes
  (most common in science departments)
- Ingestion
  (wash your hands before you eat)
- Injection
- Inhalation

Health Effects

Acute

- Generally manifests quickly (either immediately or within days after an exposure)
- An example would be an acid spill on skin. The acute effect is immediate irritation or corrosion of the skin.

Chronic

- Usually takes longer to develop through repeated exposures
- Usually targets certain organs (i.e. asbestos targets the lungs).
- An individual may not be able to sense the exposure.

Labeling

- Product identifier – chemical identity
- Supplier identification – name, address, etc.
- Hazard pictograms – visual warning
- Signal words – degree of hazard
- Hazard statements – nature of hazard
- Precautionary statements – advice
- Supplemental information – additional information about the substance

Labeling

Secondary Labels

- Needs to have all the information from the original shipping label…

OR

- Product identifier & words, pictures, and symbols which provide at least general information regarding the hazards; including the specific information regarding the physical and health hazards.

EXCEPTION

- Portable, immediate-use containers, used by the employee who transfers the chemicals, do not have to be labeled (not a change).

GHS Pictograms

Flame
(Flammables)

Flame Over Circle
(Oxidizers)

Exploding Bomb
(Explosives)

Corrosive
(Corrosives)

Gas Cylinder
(Gases Under Pressure)

Skull & Crossbones
(Acute Toxicity)

Exclamation Mark
(Irritants/Sensitizers/
Other Hazards)

Environment
(Aquatic Hazards)

Health Hazard
(Specific Toxicity
Hazards)

Signal Words

Signal words

- Used to emphasize hazard and discriminate between levels of hazard.

The signal words used in the GHS are:

for more severe hazards

for less severe hazards

Hazard Statements

A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical; including, where appropriate, the degree of hazards.

- Example: Flammable liquids
  - **Extremely flammable liquid and vapor**
  - **Highly flammable liquid and vapor**
  - **Flammable liquid and vapor**
  - **Combustible liquid**

Precautionary Statements

Precautionary information supplements the hazard information by briefly providing measures to be taken to minimize or prevent adverse effects from physical, health or environmental hazards.

First aid is included in precautionary information.

For example:

- **Wear splash protection for face**
- **Keep away from heat/sparks/open flame**
- **Use explosion-proof electrical… equipment**
- **Wear protective gloves**

Health Hazard Classification

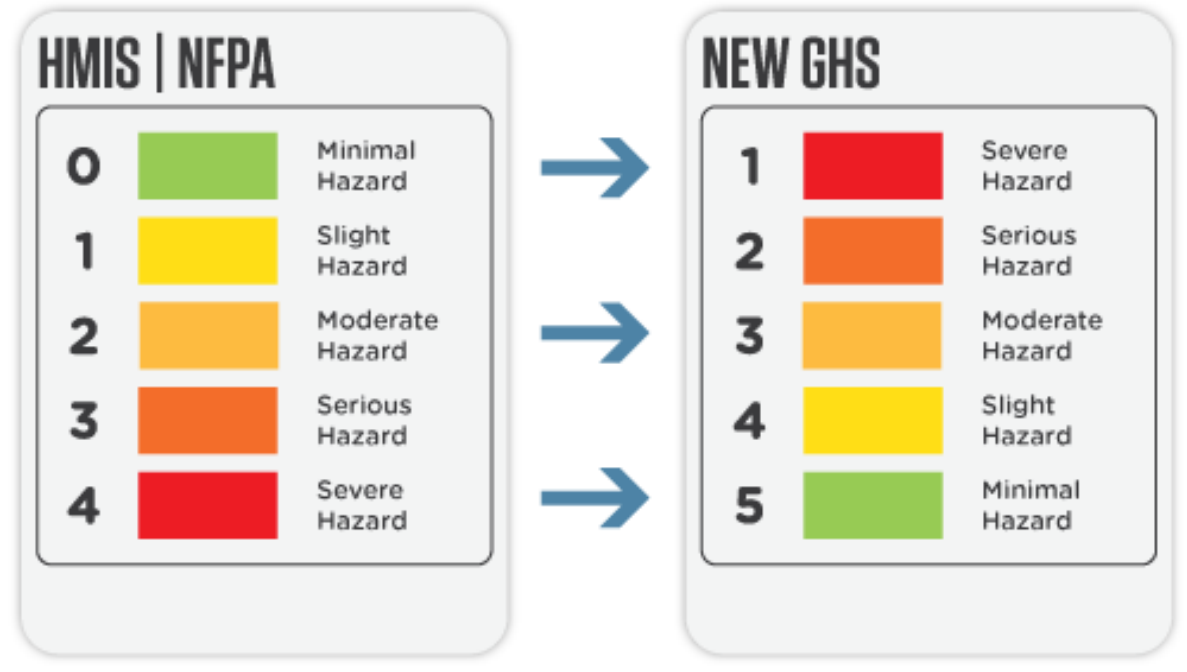
- Acute Toxicity
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Respiratory or Skin Sensitization
- Germ Cell Mutagenicity
- Carcinogenicity
- Reproductive Toxicology
- Target Organ Systemic Toxicity - Single Exposure
- Target Organ Systemic Toxicity - Repeated Exposure
- Aspiration Toxicity

Physical Hazard Classification

- Explosives
- Flammable Gases
- Flammable Aerosols
- Oxidizing Gases
- Gases Under Pressure
- Flammable Liquids
- Flammable Solids
- Self-Reactive Substances
- Pyrophoric Liquids
- Pyrophoric Solids
- Self-Heating Substances
- Substances which in contact with water emit flammable gases
- Oxidizing Liquids
- Oxidizing Solids
- Organic Peroxides
- Corrosive to Metals

Other Warning Systems vs. GHS

- NFPA & HMIS uses 0-4 scales with 4 being most hazardous
- GHS uses 1- 4 scales with <u>1, 1A or Type A</u> as most hazardous



Safety Data Sheet (SDS)
16 Sections

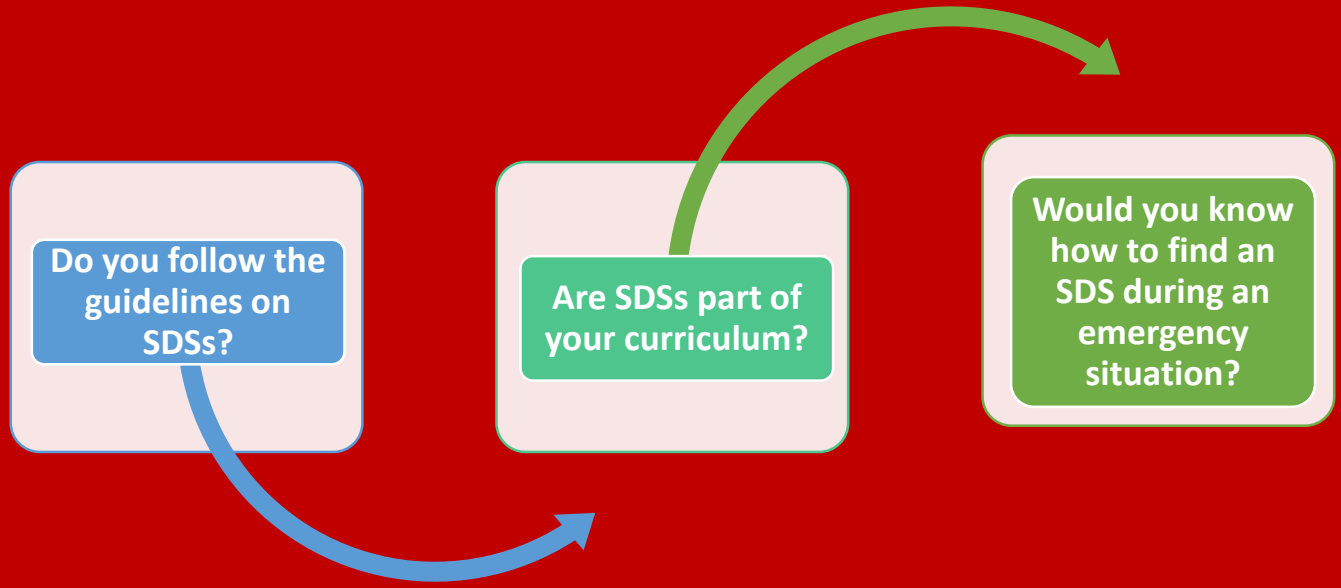
1. Identification of the substance or mixture and of the Supplier
2. **Hazards Identification**
3. Composition/Information on ingredients
4. First Aid Measures
5. Firefighting Measures
6. Accidental Release Measures
7. Handling and Storage
8. **Exposure Controls/Personal Protection**
9. Physical and Chemical Properties
10. Stability and Reactivity
11. Toxicological Information
12. Ecological Information (not mandatory)
13. Disposal Considerations
14. Transport Information
15. Regulatory Information
16. Any other information including date or revision date of SDS

Role of the SDS

- **Primary Use:** The Workplace
- The SDS should provide comprehensive information about a chemical substance or mixture.
- Employers and workers use the SDS as a source of information about hazards and to obtain advice on safety precautions **prior to use of chemical.**

Safety Data Sheets (SDSs)

- Available online on the Facilities and Safety page of the Eden Prairie Schools website.
- Responsibility of instructor to obtain SDSs for new products received



Chemical Storage Requirements

- Designated locked storage area
- Arrangement by Flinn or other system
- Acid and flammable cabinets
- Fire extinguishers
- Smoke detectors

Personal Protective Equipment (PPE)

Why PPE?

It's the last line of defense between you and the hazardous chemical.

What types of PPE are required?

- Goggles and Face Shields
- Gloves (disposable – chemical – heat)
- Aprons

Instruct students on purpose and proper use

Lead by example!

Fume Hoods

- Use for odorous chemicals (NOT storage)
- Provides more protection against splashes, bumping
- NOT for general storage
- Ensure adequate air flow
- Avoid disruptions to air flow
- Keep clean
- Tested every year and posted on hood

Wash your hands!!!

- Use warm water
- Wet both hands and wrists
- Apply liquid soap to palms first
- Lather well, spread lather to back of hands and wrists
- Scrub for at least 15 seconds
- Rinse well and dry completely
- Turn off faucet using disposable towels

Emergency Equipment

- Fire extinguishers – should be located near exit and visible to all
- Eyewash and/or shower
- Safety goggles/face shields
- Gloves (disposable, chemical, thermal)
- Aprons
- Spill cleanup kits

Emergency Procedures: FIRE

- Primary responsibility is to evacuate students
- It is not recommended to fight fires, if they are above waist-height
- Those who are trained may use fire extinguishers but…

your safety and the safety of your student's is your first priority!

Emergency Procedures: CHEMICAL SPILLS

- Assess spill. If chemicals are unknown, evacuate area. Call emergency personnel if your safety is in danger or the spill is too large to handle yourself.
- Contact fire department, if contents are greater than one gallon.
- Extinguish all sources of ignition, if chemical is flammable, and turn off the main gas shut-off valve.
- Immediately attend to splashes in eyes or on skin by using eyewash or drench shower.
- Direct First Aid needs to the school nurse.

Emergency Procedures: CHEMICAL SPILLS *(continued)*

Use appropriate

personal protective equipment!!!!

- Use appropriate spill neutralizer from spill kit (acid or base). Follow instructions on box.
- Use the polypropylene broom and dustpan, provided with neutralizer kit, to sweep up materials. Dispose of according to hazardous waste rules and regulations (if applicable).

Emergency Procedures: CHEMICAL SPILLS *(continued)*

- If a release of **any substance** may cause pollution of the air, land or water, report the incident immediately to the district Director of Facilities. The district is required to notify the **Minnesota Duty Officer** (within 24 hours) at:

(651) 649-5451 - Metro
(800) 422-0798 - Greater Minnesota

Waste Disposal

- **Hazardous wastes must be labeled:**
  - **“Hazardous Waste”**
  - **Descriptive name (no chemical symbols)**
  - **Date the waste was put into the container or determined to be waste**

Other Hazards in Labs

Natural Gas

- Shut off valve must be identified and marked.
- Keep off and locked out when not in use.

Sharps/Broken Glass

- A disposal container specifically for broken glass should be available.

Additional SOPs

- Students are not permitted to work in the labs without supervision.
- Shorts, sandals, and loose jewelry are not worn while using chemicals.
- Long hair should be pulled back while using chemicals.
- Eating and drinking (students *and* instructors) is not allowed in labs.
- Extension cords are not used as permanent wiring.
- Damaged extension cords are REPLACED (not repaired).

Additional SOPs *(continued)*

- Refrigerators are labeled for contents (food or chemical/biological).
- Chemicals are labeled upon arrival with purchase date .
- Eyewashes, showers, fire extinguishers are not blocked.
- Exits are not blocked.
- Electrical panels are not blocked.
- No storage within 18 inches of sprinkler heads.

Eyewash/Shower Inspections

Emergency Eyewashes & Showers require weekly Inspections which must be **documented** on the inspection tag.

- All plumbed eyewashes must be flushed for 3 minutes weekly.
- Plumbed showers should be flushed briefly on occasion (monthly) to ensure proper function.
- Portable eyewashes require weekly inspections (follow manufacturers instructions).
- All units must be accessible, clearly marked, clean, and nozzle covers must be in place.

Monthly Fire Extinguisher Inspections

- Ensure that the fire extinguisher is accessible.
  - Are any materials blocking the fire extinguisher?
  - Is it visible from all points in the room?
    - If not, is there proper demarcation above the fire extinguisher?
- Is the fire extinguisher properly mounted in the cabinet or on the wall?
- Is the pressure indicator in the ‘green’?
  - Tap the pressure indicator to ensure it is functional
- Has the fire extinguisher been vandalized in any way to comprise its function?
- Be sure to initial and date the inspection tag, at time of inspection.

Thank You for completing the Chemical Hygiene/ERK training

Again, If you have any questions regarding this training or any other health and safety topic, please contact

Kyle Fisher, Facilities and Safety Coordinator

952-975-7000 or Kyle_fisher@edenpr.k12.mn.us

Don’t forget the quiz –

The link is on the next page…

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Link to the Required Quiz

https://forms.gle/63HPMgZwi6C8TvjA7