CHEMICAL STORAGE AND HANDLING IN SCHOOLS

JENNIFER LONG

UFT SAFETY AND HEALTH

AGENDA

Chemical Storage Standards (OSHA and FDNY)

Chemical Storage Guidelines/Best Practices

Chemical Inventory

Material Safety Data Sheets

Transporting Chemical

Handling of Chemicals

Chemical Disposal

WHY MIGHT SCHOOLS HAVE DIFFICULTY PROPERLY MANAGING CHEMICALS?

- **Lack of training**
- **Lack of system**
- **Lack of "somebody in charge" (add-on duty)**
- **Inherited chemicals**
- **Spend it or lose it monies**
- **Lack of communication across Academic, Administrative, & Facilities departments**
- **Facilities often not built for handling chemicals (ventilation, storage problems)**
- **Lack of funds/planning for disposal costs**

CHEMICAL STORAGE - REQUIREMENTS

Per Federal standards (OSHA, EPA, Etc)

- There must be an inventory list of hazardous chemicals as defined in the DOE Chemical Hygiene Plan (http://schools.nyc.gov/NR/rdonlyres/8F93A719-2021-43D0-B829-859EEBD32967/13923/NYCDOECHEMICALHYGIENEPLAN20062009.pdf.)
- Chemical containers must be labeled with a minimum of chemical name, hazard warnings and target organs
- Containers shall be dated when received and opened.
- Accompanying safety data sheets must be kept.

CHEMICAL STORAGE - REQUIREMENTS

Per FDNY storage standards

- Pre-existing labs. Labs that were approved by the FDNY before July 1, 2008. The majority of the science laboratories in NYC public schools are classified as Type II or Type IV laboratories unless the areas have a fire-resistance rating of at least 2 hours.

Table. Quantity Limitation for Pre-existing Laboratory

Lab Type	Fire Rating (hr)	Fire Protection	Flammable and Combustible liquids
I	2	Sprinklered	30 Gallons
II	1	Sprinklered	25 Gallons
III	2	Nonsprinklered	20 Gallons
IV	1	Nonsprinklered	15 Gallons

CHEMICAL STORAGE-REQUIREMENTS

Per FDNY storage standards

- New labs: All educational and instructional non-production laboratories established on or after July 1, 2008 are required to be in compliance with the 2008/2014 Fire Code and shall comply with the Class “D” laboratory requirements.

Table. Quantity Limitation Flammable and Combustible Liquids

Laboratory unit hazard classification	Excluding Quantities in Storage Cabinets or Safety Cans		Including Quantities in Storage Cabinets or Safety Cans	
	Maximum Quantity Class I Liquids Alone per Lab Unit (gal)	Maximum Quantity Class I, II, IIIA Liquids per Lab Unit (gal)	Maximum Quantity Class I Liquids Alone per Lab Unit (gal)	Maximum Quantity Class I, II, IIIA Liquids per Lab Unit (gal)
Class D	0.5 gals/100 ft² 37.5 (max)	0.5 gals/100 ft² 37.5 (max)	1 gals/100 ft² 75 (max)	1 gals/100 ft² 75 (max)

CHEMICAL STORAGE – GENERAL GUIDELINES

- **Avoid storing liquid chemicals above eye level.**
- **Avoid storing chemicals in aisle ways.**
- **Avoid over stocking shelves.**
- **Avoid storing heavy containers above shoulder level.**
- **Avoid storing chemicals in fume hoods or on counter tops.**
- **Avoid storing chemicals near sources of heat or in direct sunshine.**


EDTA
PASTEUR

CHEMICAL STORAGE ALPHABETICALLY

What you may be doing now…

- Storing Chemicals Alphabetically – Could result in incompatible chemicals stored next to each other

A safer alternative…

- Storing by Chemical Group – All nitrates together, sulfates together (can be alphabetical within their groups)

CHEMICAL STORAGE – HAZARD CLASS

At a minimum, chemicals should be segregated as:

Corrosives

Oxidizers

Flammable Liquids

Poisons or Toxic Chemicals

Reactive (water or time sensitive)

CHEMICAL STORAGE – CORROSIVES

- **Store concentrated acids and bases separately.**

- **Keep corrosives away from organic chemicals and combustible materials.**
- **Use secondary catch basins for concentrated acids and bases.**

Red with Yellow

Nitric acid stored with other acids

Keep acetic acid away from other acids

CHEMICAL STORAGE – FLAMMABLE LIQUIDS

As a general rule of thumb, no more than 10 gallons of flammable liquids should be stored outside of an approved flammable storage cabinet. Storage of 1 gallon and more of flammabmle liquids will require FDNY permitting.

CHEMICAL STORAGE - FLAMMABLE LIQUIDS

When refrigerating flammables, only use refrigerators specifically designed for flammable materials.

Do not store food in chemical storage refrigerators.

Label chemical storage refrigerators with the following:

- No Food – Chemical Storage Only

Explosion-Proof Refrigerator **VS** **Regular Refrigerator**

CHEMICAL STORAGE – OXIDIZERS

Store oxidizers away from flammable and combustible materials.

Store oxidizers away from reducing agents.

Maintain the minimum quantity needed and dispose of unneeded material immediately.

CHEMICAL STORAGE – TOXIC CHEMICALS

Maintain the minimum quantity needed and dispose of unneeded material immediately.

Store in unbreakable containers or use secondary containers.

Label storage areas with designated area signs.

CHEMICAL STORAGE – REACTIVE

Examples of reactive chemicals would include, but not be limited to:

Water reactive chemicals.

Examples: lithium, sodium, potassium

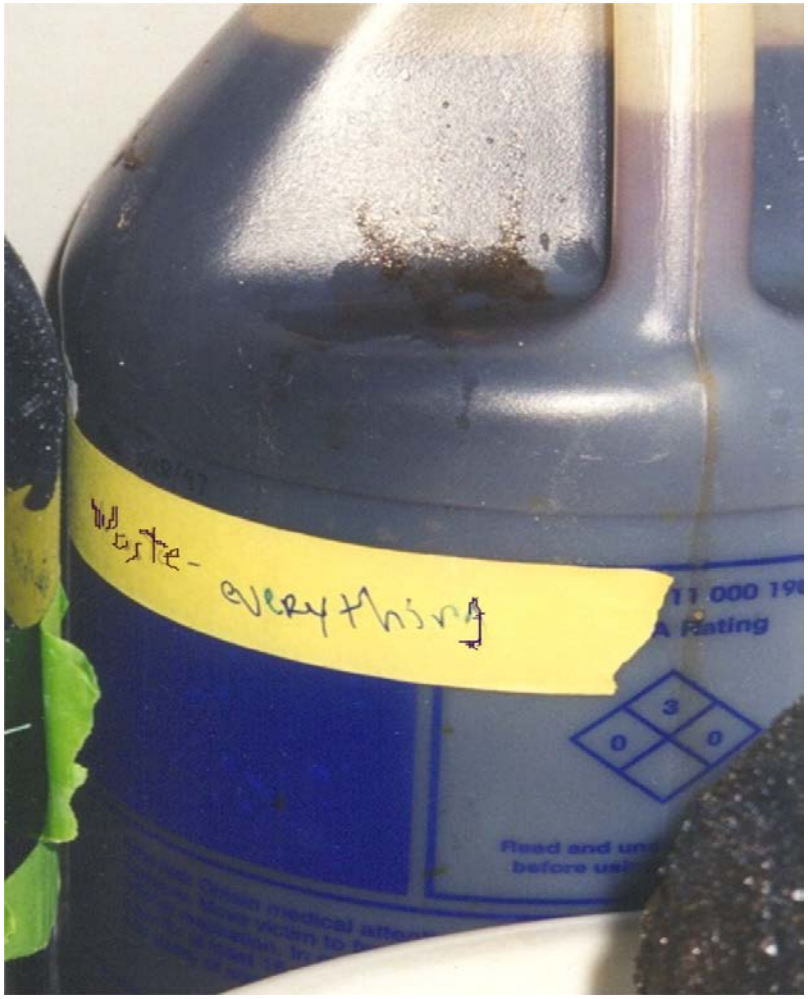
Pyrophoric, which react with air.

Examples: iron sulfide, phosphorus

Peroxide forming chemicals, which form shock sensitive explosives.

Examples: diethyl ether, picric acid

LABELING



OSHA REQUIREMENTS ON LABELLING

Acetone

DANGER

Highly flammable liquid and vapor. Causes serious eye irritation. May cause drowsiness or dizziness. Repeated exposure may cause skin dryness and cracking.

PREVENTION

Keep away from heat, sparks, and open flames. — No smoking. Keep container tightly closed.

Avoid breathing vapors. Use only outdoors or in a well-ventilated area. Wear eye protection.

RESPONSE

If on skin: Rinse skin with water.

If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide for extinction.

STOCKPILING/OVER-PURCHASING

CHEMICAL INVENTORY

Having a good inventory system helps to properly manage/maintain a safer lab.

- By knowing what you have, you can use it more efficiently
- Helps teachers track what they use each year versus what can be disposed of
- Helps teachers organize chemicals by their properties (flammability, reactivity, acids)
- Also sometimes required for submittal by NYCDEP Community Right to Know Law depending on the quantities stored.

~~MATERIAL~~ SAFETY DATA SHEETS

Recommend a binder

A copy in the lab

A copy in the school office

UNLOCKED STORAGE

TRANSPORTING CHEMICALS

If chemicals are transferred to a second container, make sure the new container is labeled with the chemical name.

Use secondary containers, with handles, made of rubber, plastic or metal.

Secondary containers should be large enough to contain all of the chemical contents.

TRANSPORTING CHEMICALS

Make sure the pathway is clear of obstructions and tripping hazards.

Plan ahead for spills.

Transport only the quantity needed to complete the experiment.

Use sturdy carts when transporting heavy containers or transporting over long distances.

CHEMICAL HANDLING

Be familiar with chemical properties and products of chemical reactions.

Be prepared for chemical spills and clean up spills immediately.

Plan ahead – have apparatus and associated equipment ready before chemicals are used.

Use the appropriate equipment, such as funnels, beakers and spatulas when transferring chemicals.

CHEMICAL HANDLING

Use chemical fume hoods to control exposure as chemicals are transferred.

Use chemical fume hoods to control exposure during the experiment.

Wear the appropriate personal protective equipment (chemical splash goggles, gloves, etc.).

Have disposal containers ready ahead of time.

CHEMICAL DISPOSAL AND RECYCLING

Store different chemical waste substances separately in labeled containers. The labels should list the specific hazards and the date the substance became waste.

Notify the assistant principal and custodian.

Use chemical removal request form to list type of chemicals, amount and room location.

The custodian will complete a PO-18 and attach the list of chemicals being removed from

the school.

The custodian will use a Trade Code 75 on the PO-18, Crew #IN27.

The custodian will Fax (718-361-3844) information to M. Pedram (Phone: 718-361-3701) via the passport system.

- Make as many copies of this form as needed.
- Attach the form(s) to a PO I8 request
- Keep a copy for your records

Fax to: (718) 361-3844
Att: M. Pedram

Via Passport System
Notify M. Pedram

Use: **Trade Code 75 – Crew# IN27 – job type EB** on the PO I8 request.

Chemical Removal Request Form

School:____

Address:____

Borough:________________________**Zip Code:**______-____

Date:________________

Name of chemical	Number x Size = Total	Room No.
	x =	
	x =	
	x =	
	x =	
	x =	
	x =	
	x =	
	x =	
	x =	
	x =	
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Principal's Signature:________________

Contact Person:________________ **Telephone:**(___)____________
Custodian:____________________ **Telephone:**(___)____________

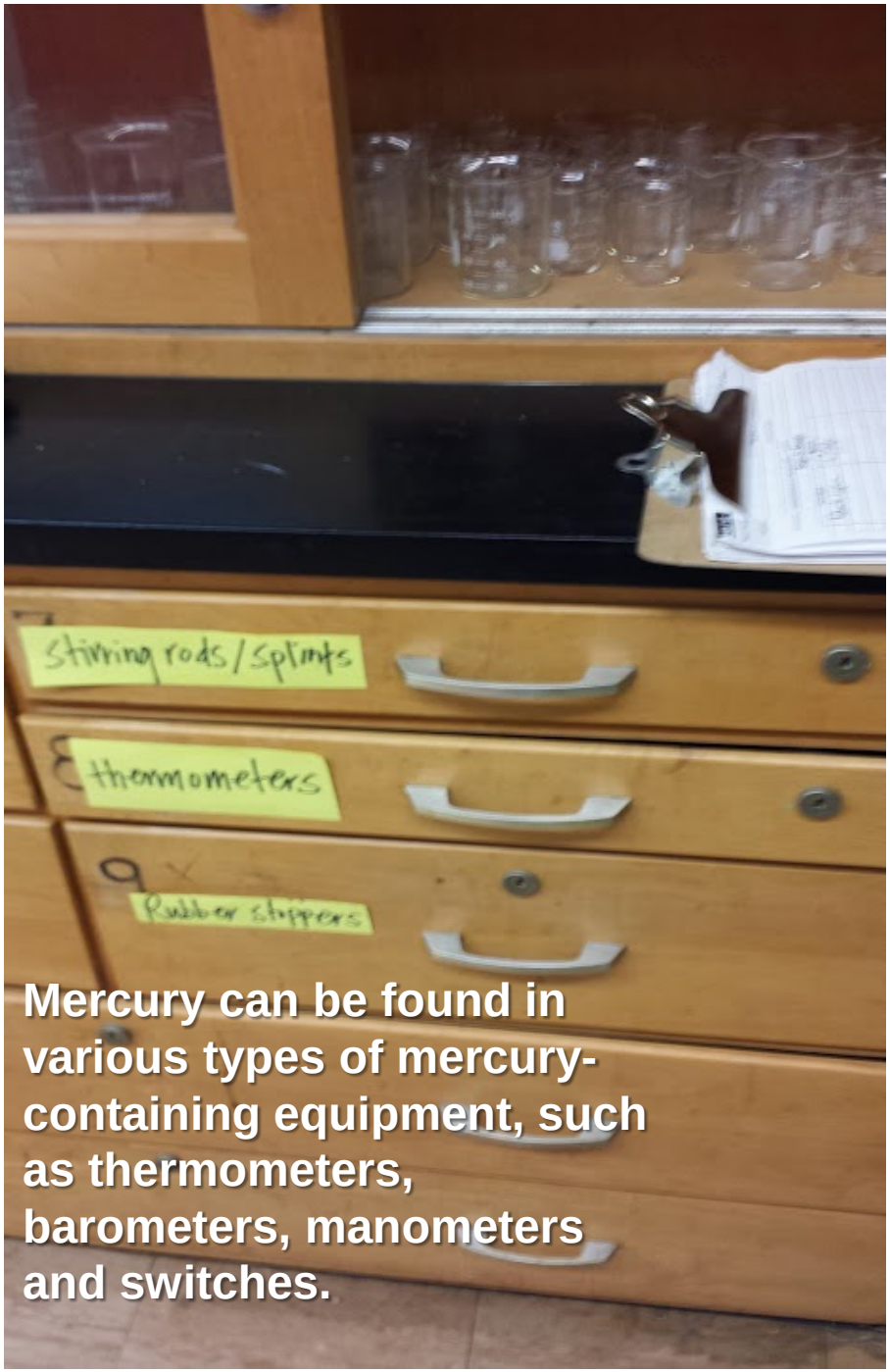
MERCURY

Remove from your school lab with Chemical Disposal Form:

- Bulk Mercury
- INTACT Mercury Containing Equipment (thermometers)

Responding to a suspected mercury spill:

- Do not attempt to clean-up
- Evacuate the area
- Close and lock the door to the affected room
- Isolate the spill area if applicable
- Immediately notify the principal & custodian
- A hazardous waste company will perform the
- Clean-up and conduct air monitoring



Mercury can be found in various types of mercury-containing equipment, such as thermometers, barometers, manometers and switches.

RESOURCES 1

Flinn Scientifc
https://www.flinnsci.com/teacher-resources/safety/

OSHA Lab Standard
https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf

CDC's School Chemistry Laboratory Safety Guide
https://www.cdc.gov/niosh/docs/2007-107/pdfs/2007-107.pdf

RESOURCES 2

EPA's Healthy School Web Portal
www.epa.gov/schools

OSHA HAZCOM Pictogram

https://www.osha.gov/Publications/OSHA3636.pdf

DOE OOSH website

http://schools.nyc.gov/Offices/DHR/EmployeeSafety/Occupational+Safety+and+Health.htm

UFT Lab Specialist Chapter website

http://www.uft.org/chapters/lab-specialists