NYS Right to Know/Hazard Communication Training

Office of Environmental Health and Safety

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A – 1108A, x-6048

What is the Hazard Communication Standard?

- OSHA (the Occupational Safety and Health Administration) developed this standard in the mid 80's to ensure that employees were provided information by their employers and were aware of the hazards associated with the chemicals they were working with. Employers were also to provide for the proper protection from exposure to these chemicals.
- Prior to the Federal Hazard Communication Standard, New York State had developed a state based worker information program called the New York Right to Know Standard. This is under the NYS Department of Labor, Public Employees Safety and Health division or PESH.
- Baruch employees, being New York State (Public) employees, are covered by PESH, not OSHA.
- PESH adopts all OSHA regulations within six months after promulgation.

Hazard Communication/Right to Know

- Both these laws ensure that employers provide their employees with information on the chemical hazards they work with in three ways:
  - Training
  - Labeling
  - Material Safety Data sheets (MSDS)

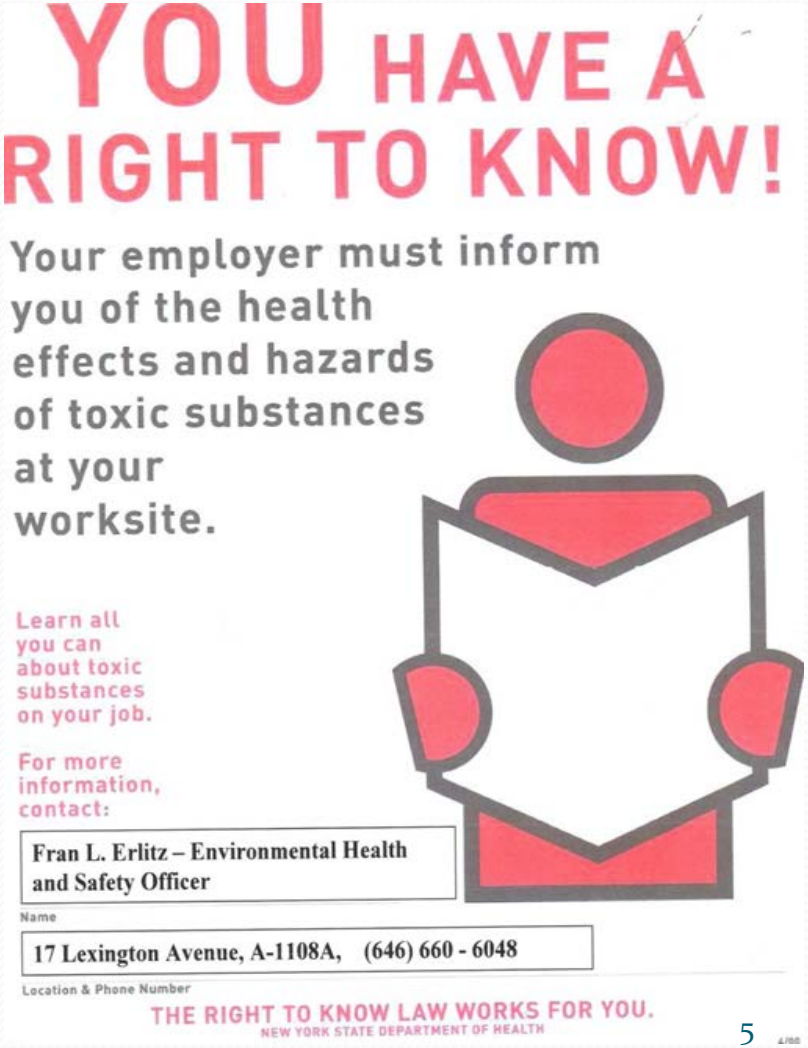
The Role of the Office of Environmental Health and Safety

The EHS Office is responsible for ensuring all regulatory requirements are adhered to with this standard:

- Provide a written Hazard Communication Program (describing all of aspects of this program at Baruch)
- Training for those departments that regularly handle hazardous materials
- Inventory of all chemical materials at the College
- Label chemicals that are not already labeled by the manufacturer
- Provide Material Safety Data Sheets where chemicals are stored and in departmental offices
- Environmental reporting to outside agencies
- Collecting and contracting hazardous waste disposal

Right to Know Posters

- These posters appear around the college and give contact information for Environmental Health and Safety when information is needed about chemicals in the workplace.



Determining Chemical Hazards

- Chemical hazards are determined by inventorying all chemical materials on campus.
- Each department is required to keep a chemical inventory of all its chemical materials
- EHS will ascertain the hazards of each chemical and its use
- Household products are exempt from these standards

Hazards

A chemical can be hazardous as a health or physical hazard:

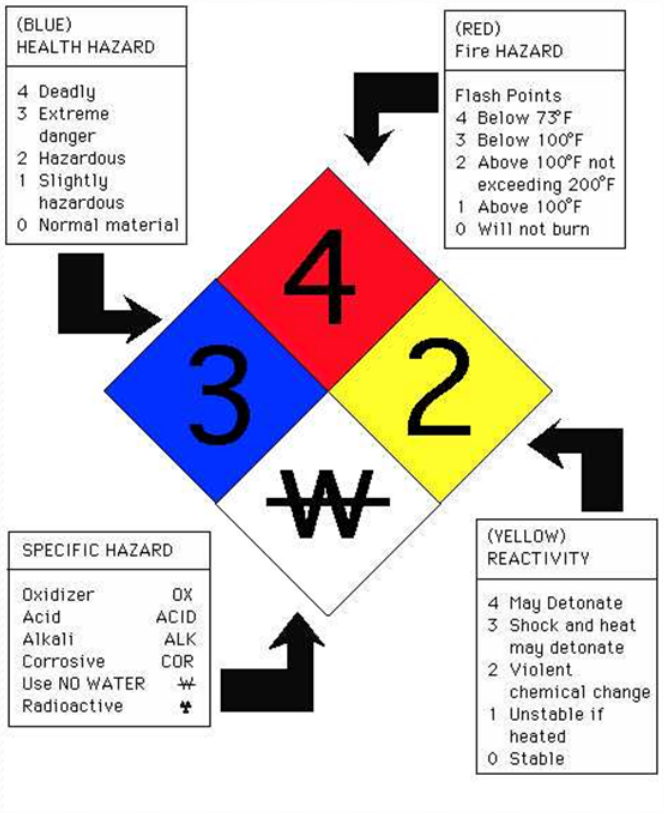
- Physical hazards:
  - flammable, combustible, explosive, or reactive
- Health hazards:
  - cancers, respiratory illness, blood disorders, neurological disorders, skin irritants, etc.

Labels

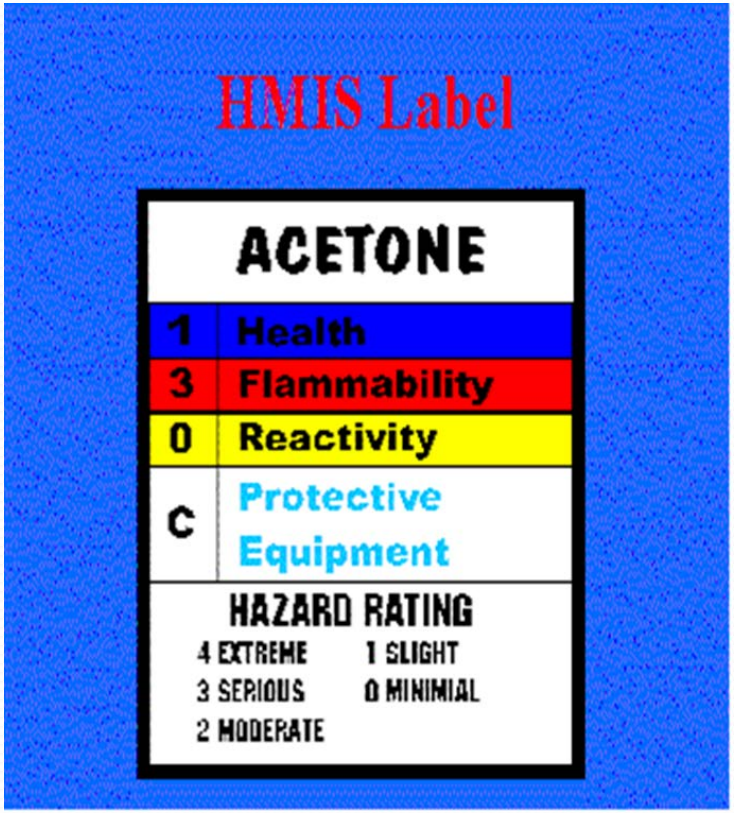
- All chemicals must be labeled when coming from the manufacturer.
- The labels must give the name of the chemical and list the hazards.
- Hazards can be represented in several formats:
  - NFPA (National Fire Protection Association)
  - HMIS (Hazardous Materials Information System)

Hazard Labeling

National Fire Protection Association



Hazardous Material Information System



Material Safety Data Sheets (MSDS)

- Material Safety Data Sheets are informational guidelines for working safely with a particular chemical. Up until recently, there was no standardization for MSDSs
- A manufacturer could choose an 8 section (OSHA)or 16 section (ANSI) format and fill the information as they deemed necessary:

Information on a 16 Section MSDS format

- **Section 1. Identification**
  Section 2. Hazard(s) identification
  Section 3. Composition/information on ingredients
  Section 4. First-Aid measures
  Section 5. Fire-fighting measures
  Section 6. Accidental release measures
  Section 7. Handling and storage
  Section 8. Exposure controls/personal protection
  Section 9. Physical and chemical properties
  Section 10. Stability and reactivity
  Section 11. Toxicological information
  Section 12. Ecological information
  Section 13. Disposal considerations
  Section 14. Transport information
  Section 15. Regulatory information
  Section 16. Other information, including date of preparation or last revision

Sections 1 - 4

- Section 1 – Identification – name or names of chemical, manufacturers name, address, telephone number, emergency contacts
- Section 2 – Hazards Identification – emergency warnings, routes of entry, effects from exposure, etc.
- Section 3 – Composition/Ingredients – listing of all components, percentages, CAS (Chemical Abstract Service) numbers
- Section 4 – First Aid - treatment in the event of exposure

Sections 5 - 8

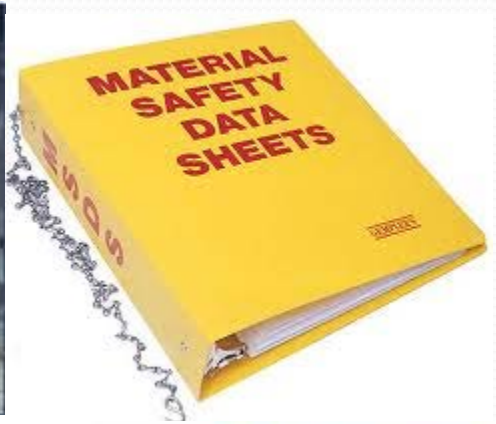
- Section 5 – Fire Fighting Measures – how address in the event of a fire, extinguishing media
- Section 6 - Accidental Release - what to do in the event of a spill, spill media, disposal restrictions
- Section 7 – Handling and Storage – safe handling and what to avoid, how to store (in freezer, refrigerator, ventilated area etc.)
- Section 8 – Exposure Controls and Personal Protection - OSHA PELs (Permissible exposure levels) what types of Personal Protective Equipment should be used, what types of engineering controls when working with it

Sections 9 - 16

- Physical and Chemical Properties - chemical structure, molecular weight boiling point, flash point
- Stability and Reactivity - how stable is chemical, decomposition, reacts with other chemicals
- Toxicology Information - toxicology studies from published literature (RTECS)
- Ecological Information - from published data
- ETC.

Material Safety Data Sheets

- Material Safety Data Sheets are kept in binders, file drawers or electronic files at work locations (where the chemicals are stored) and in departmental offices for those departments that routinely handle hazardous materials.



Global Harmonized System (GHS) and the Revised OSHA Hazard Communication Standard

- The United Nations developed a system that takes Hazard Communication on a Global level. They created the Global Harmonized System which was adapted by OSHA in March 2012. **Phase in of this system (under the revised Hazard Communication Standard) is to begin immediately with training; completion of training to occur by December 2013.**
- GHS is a global system of chemical classification: labeling and "safety data sheets" will provide information on chemicals including physical, health and environmental hazards on a global scale. This is done by adopting a STANDARD SYSTEM of labeling through wording, pictograms, and chemical classification.

Global Harmonized System and Revised OSHA Hazard Communication Standard

- Under the former OSHA Hazard Communication, these things were not standardized, and manufacturers could choose from many varieties of labeling and wording.
- Under this new system, every manufacturer must conform to set standards that have been determined and set under this new ruling. These standards were developed by negotiations over several years by hazard communication experts from many different countries, international organizations, and stakeholder groups using major existing systems around the world as a basis.

Global Harmonized System (GHS) and Revised Hazard Communication Standard (HCS)

The three major areas of change are in hazard classification, labels, and safety data sheets:

- **Hazard classification:** The definitions of hazard have been changed to provide specific criteria for classification of health and physical hazards, as well as classification of mixtures. These specific criteria will help to ensure that evaluations of hazardous effects are consistent across manufacturers, and that labels and safety data sheets are more accurate as a result
- **Labels:** Chemical manufacturers and importers will be required to provide a label that includes a harmonized signal word, pictogram, and hazard statement for each hazard class and category. Precautionary statements must also be provided
- **Safety Data Sheets:** Will now have a specified 16-section format

Changes to the Old Hazard Communication Standard

- Manufacturers' compliance will span from 2015 – 2016, in which they must:
  - Alter labeling to conform with the GHS system
  - Issue "Safety Data Sheets" (SDS) instead of MSDS and redo them to conform to the new format

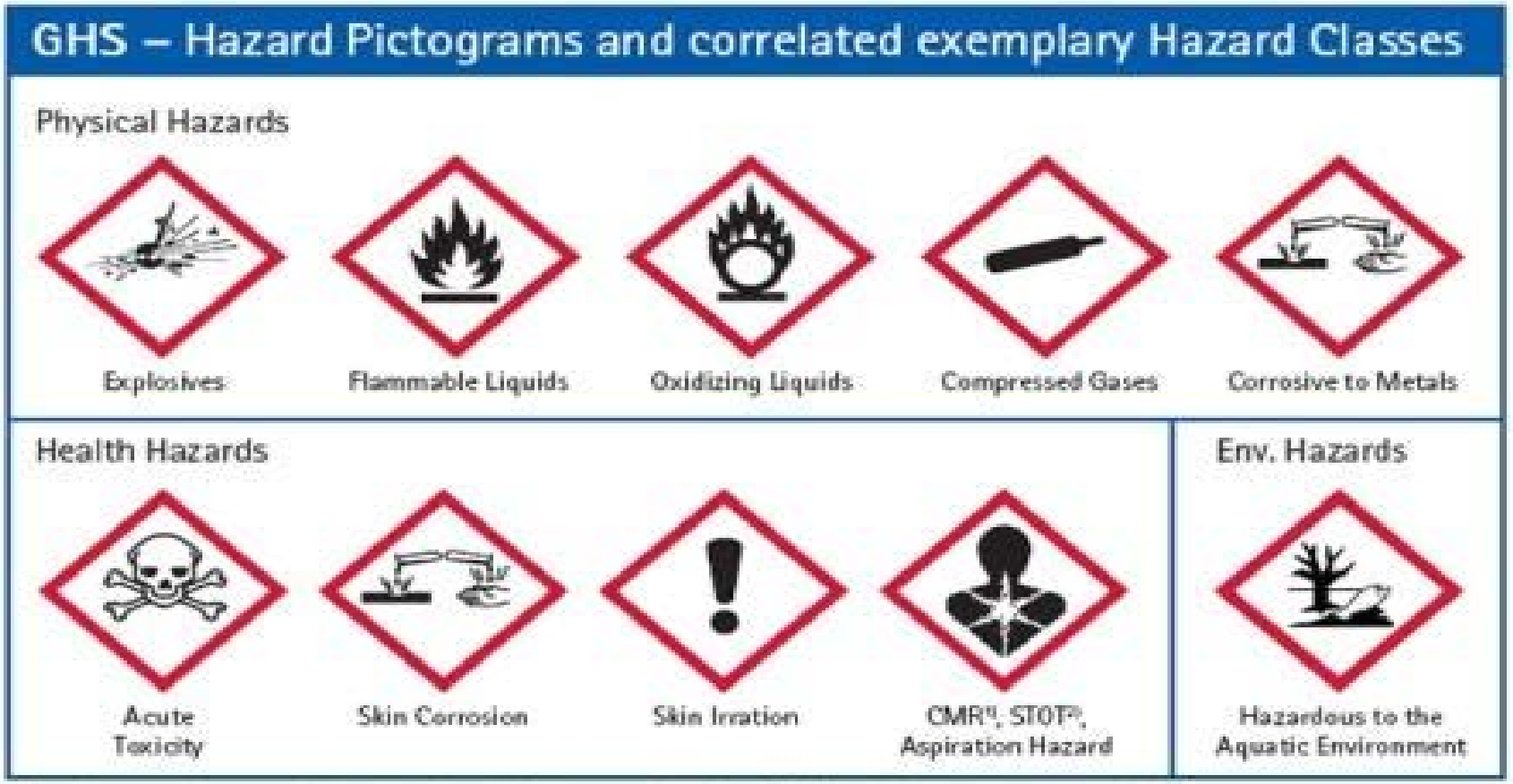
Global Harmonized System (GHS) or Revised Hazard Communication Standard (HCS)

- Under the current Hazard Communication Standard (HCS), the label preparer must provide the identity of the chemical, and the appropriate hazard warnings. This may be done in a variety of ways, and the method to convey the information is left to the preparer.
- Under the revised Hazard Communication Standard (HCS), once the hazard classification is completed, the standard specifies what information is to be provided for each hazard class and category. Labels will require the following elements:

Pictogram

A symbol plus other graphic elements, such as a border, background pattern, or color that is intended to convey specific information about the hazards of a chemical. Each pictogram consists of a different symbol on a white background within a red square frame set on a point (i.e. a red diamond). There are nine pictograms under the GHS. However, only eight pictograms are required under the HCS.

Pictograms


GHS – Hazard Pictograms and correlated exemplary Hazard Classes
Physical Hazards
Explosives
Flammable Liquids
Oxidizing Liquids
Compressed Gases
Corrosive to Metals
Health Hazards
Acute Toxicity
Skin Corrosion
Skin Irration
CMR[1], STOT[2], Aspiration Hazard
Env. Hazards
Hazardous to the Aquatic Environment
1) carcinogenic, germ cell mutagenic, toxic to reproduction / 2) specific target organ toxicity

Signal Words

A single word used to indicate the relative level of severity of hazard (if required) and alert the reader to a potential hazard on the label. The signal words used are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for less severe hazards.

Hazard Statement

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 hazard. There are over 60 hazard statements that include physical, health and environmental hazards. Some examples:

- Explosive; mass explosion hazard
- Toxic if swallowed
- Toxic to aquatic life

Hazard Statement (under pictogram)

HCS Pictograms and Hazards

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Flame

- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self Reactives
- Organic Peroxides

Exclamation Mark

- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (Non-Mandatory)

Gas Cylinder

- Gases Under Pressure

Corrosion

- Skin Corrosion/Burns
- Eye Damage
- Corrosive to Metals

Exploding Bomb

- Explosives
- Self-Reactives
- Organic Peroxides

Flame Over Circle

- Oxidizers

Environment (Non-Mandatory)

- Aquatic Toxicity

Skull and Crossbones

- Acute Toxicity (fatal or toxic)

Precautionary Statement

A phrase that describes recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous chemical, or improper storage or handling of a hazardous chemical. There are over 100 statements that are acceptable to use depending on the hazards. Some examples of precautionary statements:

- Obtain special instructions before use
- IF SWALLOWED:
- Explosion risk in case of fire
- Store in a dry place

Not in GHS but Included in the Revised Hazard Communication Standard

- **Pyrophoric gases (bursts into flames when exposed to air)**
  OSHA has retained the definition for pyrophoric gases from the current HCS. Pyrophoric gases must be addressed both on container labels and SDSs. OSHA has provided label elements for pyrophoric gases which include the signal word "danger" and the hazard statement "catches fire spontaneously if exposed to air".

- **Simple asphyxiants (displaces oxygen in the atmosphere)**
  OSHA has revised the definition of simple asphyxiants that was proposed in the Notice of Proposed Rulemaking (NPRM) as a result of comments from the regulated community. In the final HCS, simple asphyxiants must be labeled where appropriate, and be addressed on SDSs. OSHA has provided label elements for simple asphyxiants which include the signal word "warning" and the hazard statement "may displace oxygen and cause rapid suffocation".

- **Combustible dust (finely divided dust that can cause combustion and fire)**
  OSHA has **not** provided a definition for combustible dust to the final HCS given ongoing activities in the specific rulemaking, as well as in the United Nations Sub-Committee of Experts on the GHS (UN/SCEGHS).

SDS versus MSDS

MSDSs will now be known as Safety Data Sheets:

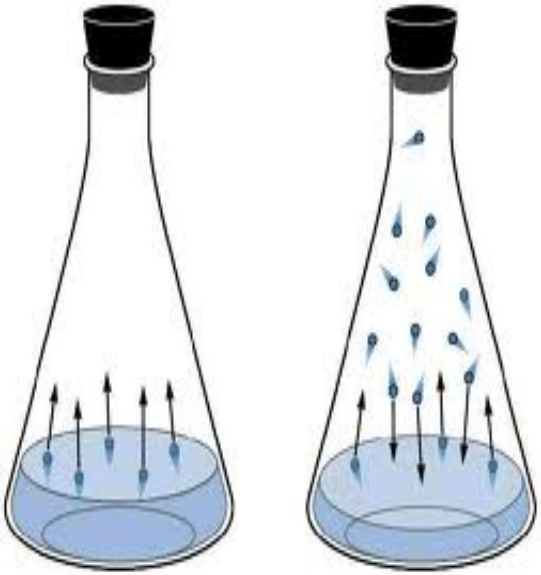
- 16 part SDS (the 8 part is no longer acceptable)
- Standardized wording
- Hazard assessment standardized

Chemicals Come in 3 Physical States

- Solids:
  - solid material
  - powders
  - dusts
  - Fumes (solid particles vaporized and re-condensed and suspended in air)

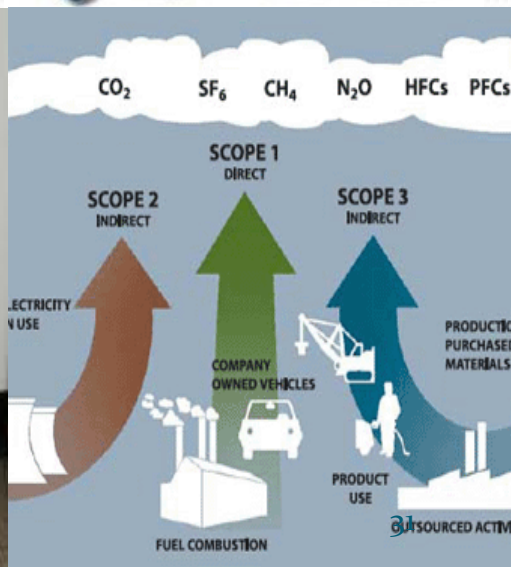
Liquids

- Fluids
- Aerosols (liquid droplets suspended in air)
- Vapors (evaporation of liquids)



Gases

- Physically cannot be seen:
  - Atmospheric (air, nitrogen, oxygen, carbon dioxide)
  - Compressed (chlorine, acetylene, refrigerants, above mentioned gases, inert gases)
  - Generating (combustion, pollutants, SMOG – combination of gases and fumes)



Exposure to Chemicals

- Worker exposure to chemicals are through three main routes and two lesser routes of entry:
  - Dermal – absorption through the skin
  - Respiratory – inhalation (nose and mouth)
  - Ingestion – accidentally swallowing (mouth)
  - Eye – splashes to the eye
  - Puncture – contaminated object punctures the skin

Target Organs

- Chemicals may enter the body through one or several routes of exposure, with the chemical targeting that organ or a different (or target) organ to result in disease or damage:
  - Mercury (inhalation – targets brain and nervous system)
  - Asbestos (inhalation – targets lungs)
  - Solvents (dermal, inhalation – targets brain, lungs, heart, nervous system, blood forming, etc.)

Acute Exposure

- Short term dose - large exposure to a chemical that results in an immediate or acute response:
  - Coughing
  - Sneezing
  - Shortness of breath
  - Red or watery eyes
  - Skin rash
  - Skin eruption

Chronic Exposure

- Exposure is in low doses - no acute effect visible. Chronic effect can be many exposures and can show effects many years after exposure (can also result from an acute effect)
  - Lung disease
  - Cancers
  - Neurological disorders
  - Blood disorders
  - Kidney disease
  - etc.

OSHA Exposure levels

- Because exposure various known common chemicals in the workplace can lead to future health issues, OSHA has developed a list of chemicals where they set the Permissible Exposure Level (PEL) or Action Level (AL). These are the levels at which one cannot be exposed at or above the set amount without exposure control measures.
- Readings at the PELs and ALs trigger requirements for:
  - Monitoring
  - Medical evaluations
  - Written exposure programs

Determining PELs and ALs

- Both PELs and ALs can be determined by using a variety of methods of sampling:
  - Direct reading instruments -
    - Gases and vapors (many different instruments available)
    - Dust, particulates, fibers, mold, etc.

Sampling

- Other types of sampling require taking a sample of the contaminant in air and sending it to a laboratory for analysis.

Sample analysis

- OSHA PELs and ALs are all based on exposure over an 8 hour day which is called a TWA (time weighted average).
- Some PELs are based on a 15 minute exposure (short term or STEL) or Ceiling limit (instantaneous) depending on how toxic the chemical is.
- All lab analysis is based on the chemical and the type of limit for that particular chemical as set by these guidelines.
- Result readings of the sample taken is based on this information.

Administrative Controls

- Due to chronic effects that many chemicals cause, it is best to protect all those that handle hazardous materials as they are using them.
- Determination of what protection is needed is done by consulting labels and MSDSs (SDSs).
- Administrative controls consist of:
  - Substituting a less hazardous chemical for a more hazardous one
  - Allowing workers limited time with a particular chemical
  - Rotating work schedule to limit handling and exposure

Engineering Controls

- Engineering controls consist of physical controls that remove the worker from the hazard or the hazard from the worker:
  - Isolation booths
  - Increased general ventilation
  - Local exhaust ventilation
    - Chemical hoods
    - Canopy or slot exhausts

Personal Protective Equipment (PPE)

- OSHA recommends using administration and engineering controls first. The remaining hazards must be addressed with Personal Protective Equipment or PPE.
- PPE comes in many forms:
  - Gloves
  - Hard hats
  - Safety glass, goggles, face shield
  - Safety shoes, boots
  - Dust masks, respirators

Gloves for Chemical Skin Protection

- There are many different types of gloves designated for different types of hazards. Those for chemical hazards are as follows:
  - Latex (natural rubber) – Bases, alcohols, dilute water solutions,
  - Nitrile (synthetic rubber) – Oils, greases, aliphatic chemicals, xylene, perchloroethylene, trichloroethane;
  - Polyvinyl alcohol - Aliphatics, aromatics, chlorinated solvents, ketones (except acetone), esters, ethers
  - Neoprene – Oxidizing acids, anilines, phenol, glycol ethers
  - Polyvinyl chloride – strong acids and bases, salts, other water solutions, alcohols
  - Butyl rubber – Glycol ethers, ketones, esters
  - Viton - Aromatics, chlorinated solvents, also aliphatics and alcohols

Gloves

Other types of gloves

- Gloves should also be worn for other hazards such as:
  - Rough handling
  - Hot or cold temperatures
  - Electrical hazards

Eye Protection

- Eye protection too comes in many forms depending on use:
  - Safety glasses
  - Goggles (for chemical splash and dust/solids)
  - Face shield

Other types of PPE

- Head protection – hard hats
- Body protections – coveralls
- Feet protection – safety shoes, boots
- Ear protection – plugs or muffs
- Knees – knee pads
- Back – back belts

Respiratory Protection

- OSHA has a separate standard for working with a respirator. Respirators protect the wearing from respiratory hazards in the form of solids, dusts, aerosols, vapors and gases.
- An employee must be evaluated prior to being assigned respiratory protection.
- This is done by identifying the hazard, assigning the proper type of respirator, and fitting the employee to ensure the respirator fits properly and creates the proper seal.

Other OSHA Recognized Hazards with Standards:

- Occupational Noise Levels – exposure to at or above set noise standards
- Heat Stress – occupational heat hazards
- Cold Stress – occupational cold condition hazards
- Fall Protection – protection while working from heights
- Lockout/tagout – protection from energized equipment
- Confined Space – protection from areas not designated for human occupancy
- Electrical hazards – various voltage protections
- Bloodborne Pathogens – working routinely with blood or bodily fluids

Chemical Spills

- If you have a chemical spill, you MUST call Environmental Health and Safety, x-6048 or Public Safety x-6000. Do not instruct Custodial Services to clean the spill.
- EHS has the proper spill equipment to safety clean up a spill and disposed of the spill material properly.
- Spill material that has picked up a chemical waste spill is considered hazardous waste and must be disposed of by federal and state guidelines.
- **Call EHS, x-6048 for all Chemical Spills**

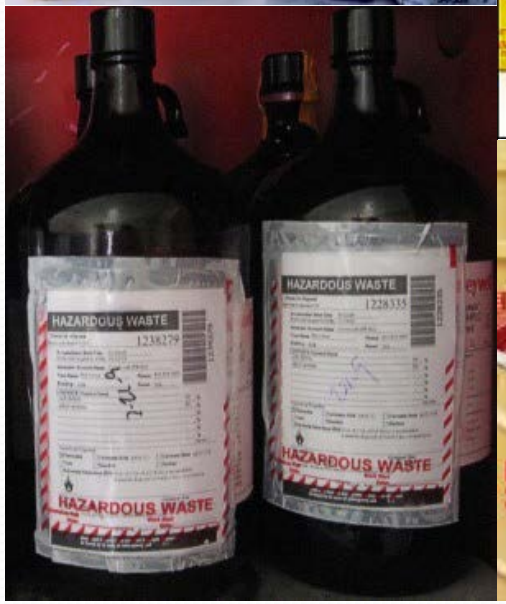
Hazardous Waste

- There are many different waste streams at Baruch that constitute hazardous waste:
  - Chemical waste
  - Medical waste
  - E-waste
  - Universal waste
  - Recycling (bottles, cans, plastic bottles, paper)

Chemical Waste

- The College contracts a vendor to remove hazardous chemical waste from the campus.
- Departments that generate chemical waste are as follows:
  - Natural Sciences
  - Buildings and Grounds

For Chemical Waste removal, call EHS x-6048



Medical waste or Infectious Waste

- Medical waste is collected in areas where first aid is administered or in other designated areas around the college. Medical waste is material that can be potentially infectious to anyone handling it without personal protective equipment.
- Medical waste is generated:
  - EMTs (Public Safety)
  - Athletics
  - Research Laboratories

For Medical Waste removal call EHS x-6048

E-waste

- The college collects and disposes through an outside recycling company all items that constitute e-waste. This includes:
  - Computers and peripherals
  - Printers
  - Laptops
  - Copiers
  - Servers
  - Faxes
  - Televisions
  - VCR and DVD players

For E-waste removal call the Help Desk x-1010

Currently NOT Considered E-waste:

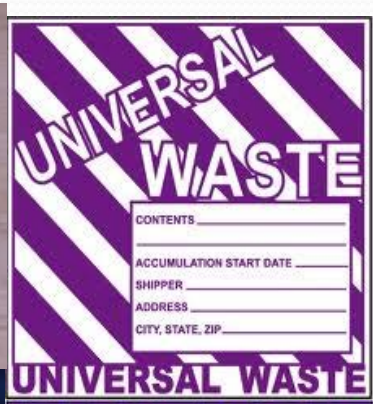
- Microwaves
- Typewriters
- Shredders
- Small Electric Appliances
- Refrigerators

Universal Waste

- The following is recognized by the EPA as being "Universal waste". This is waste that in its current state is not a hazardous substance, but damaged, broken and collected in large amounts, contains small levels of toxic metals. They are:
  - Fluorescent and compact fluorescent light bulbs
  - All batteries (except dry cell, i.e.: AA, AAA, C, D, 9 volt, etc.)
  - Light ballasts (PCB containing is hazardous waste, all other is universal waste)
  - Mercury containing thermostats

  For Universal Waste removal, call

  Buildings and Grounds, x-6630



Recycling

- Baruch is instituting recycling throughout the college. The **Task Force on Sustainability** has set up collection bins throughout to collect the following:
  - Paper (office paper, magazines, cardboard)
  - Bottles (glass, cans, some plastic)
  - General trash (non-recyclable items)

Recycling:

- Paper
- Cardboard
- Magazines
- Newspapers

Recycling:

- Bottles
- Cans
- Plastic bottles

Non - Recyclable

- General trash
  - Food
  - Non recyclable plastic
  - Styrofoam
  - Soiled paper

Containers for Collection: VC Building, classroom side

Containers for Collection: VC Building, classroom side

Containers for Collection: VC Building, office Side

Containers for Collection, VC and other buildings

Custodial waste separation

- Custodial have been trained and have equipment to separate different waste streams as well.

Sanitation Collection

CLEAR BAGS FOR RECYCLABLES

BLACK BAGS FOR TRASH

Exam

- For information on the Hazard Communication exam contact Fran.Erlitz@baruch.cuny.edu. You will receive credit for the successful completion of this exam.