

# HOUSEHOLD HAZARDOUS WASTE (HHW)

**Volunteer  
Safety Awareness**





# HHW Program Overview

- Started in 1986 as a community-based committee & partnership
- Established in 1989 and opened a permanent facility in 1990
- Currently managed by the City of Tucson Department of Environmental Services and continues to utilize both staff and volunteers

# HHWP Objectives

- Reduce the volume of toxic materials entering our landfills, sewers, air and desert surroundings
- Reduce community exposure to toxic materials
- Protect solid waste worker's health
- Safeguard groundwater from toxic contaminants





# HHWP Mission

- Prevent hazardous materials from entering the environment locally and at the point of recycling, reclamation, treatment, or disposal



# Volunteer Time Commitment

- Minimum of 4 hours per calendar year in addition to initial and annual training
- Volunteers who fail to meet the minimum requirements will be placed on inactive status.
- After three years of inactive status, a volunteer will be dropped from the program.

# Volunteer Training



- Initial Training

- New volunteers - initial training and skills assessments

- Refresher Training

- Active volunteers - annual refresher training
- Inactive volunteers (more than two years) - retake initial training and skills assessment
- Dropped volunteers (more than three years) - retake initial training and skills assessment

# Volunteer Safety



## #1 Concern

- Minimize risks - *awareness of potential hazards, follow safety guidelines, and when in doubt*

**Ask questions!**

# Course Learning Objectives

- Identify hazardous materials
- Follow safe work practices
- Utilize product labels and warnings
- Use personal protective equipment (PPE) Determine which materials are HHW
- Safely handle, sort and package HHW



# INTRO TO HAZARDOUS MATERIALS



# What is a Hazardous Material?

Any substance, material, chemical, compound, or waste (whether solid, liquid or gas) that when released to the environment is capable of causing damage, injury, illness or death



# Recognizing Hazardous Materials

- Hazardous materials are often described as being **physical** and/or **health** hazards
  - Physical hazards deal with a substance's physical properties
  - Health hazards produce adverse reactions to the body



# Physical Hazards

- Flammable and Combustible
- Reactive
- Explosive
- Water Reactive
- Pyrophoric (spontaneously ignite)
- Oxidizer (releases oxygen)
- Organic Peroxides
- Corrosive
- Asphyxiate (oxygen deficient)



# Flammables & Combustibles

- **Flammables** – easily ignited (solid, liquid or gas)
- **Combustibles** are any substance that can burn



# Flammables & Combustibles



# Flammables & Combustibles



# Reactives



- Substances that react vigorously, sometimes spontaneously, when exposed to:
  - Incompatibles: air, moisture, other chemicals
  - Physical conditions: heat, shock or pressure
- Common example:
  - Brake fluid and pool shock granules release toxic chlorine gas
- Highly reactive substances include explosives, pyrophorics, water-reactives, and peroxides

# Explosives



- A sudden chemical reaction that:
  - releases gases that rapidly expand and give off energy as they become hot,
  - resulting in a flash, a pressure shockwave and loud noise



# Explosives

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# Water Reactives

- Vigorously ignite when they contact water or humid air
- Hot and bright chemical reaction producing loud popping or fizzing

Example: alkali metals



# Water Reactives



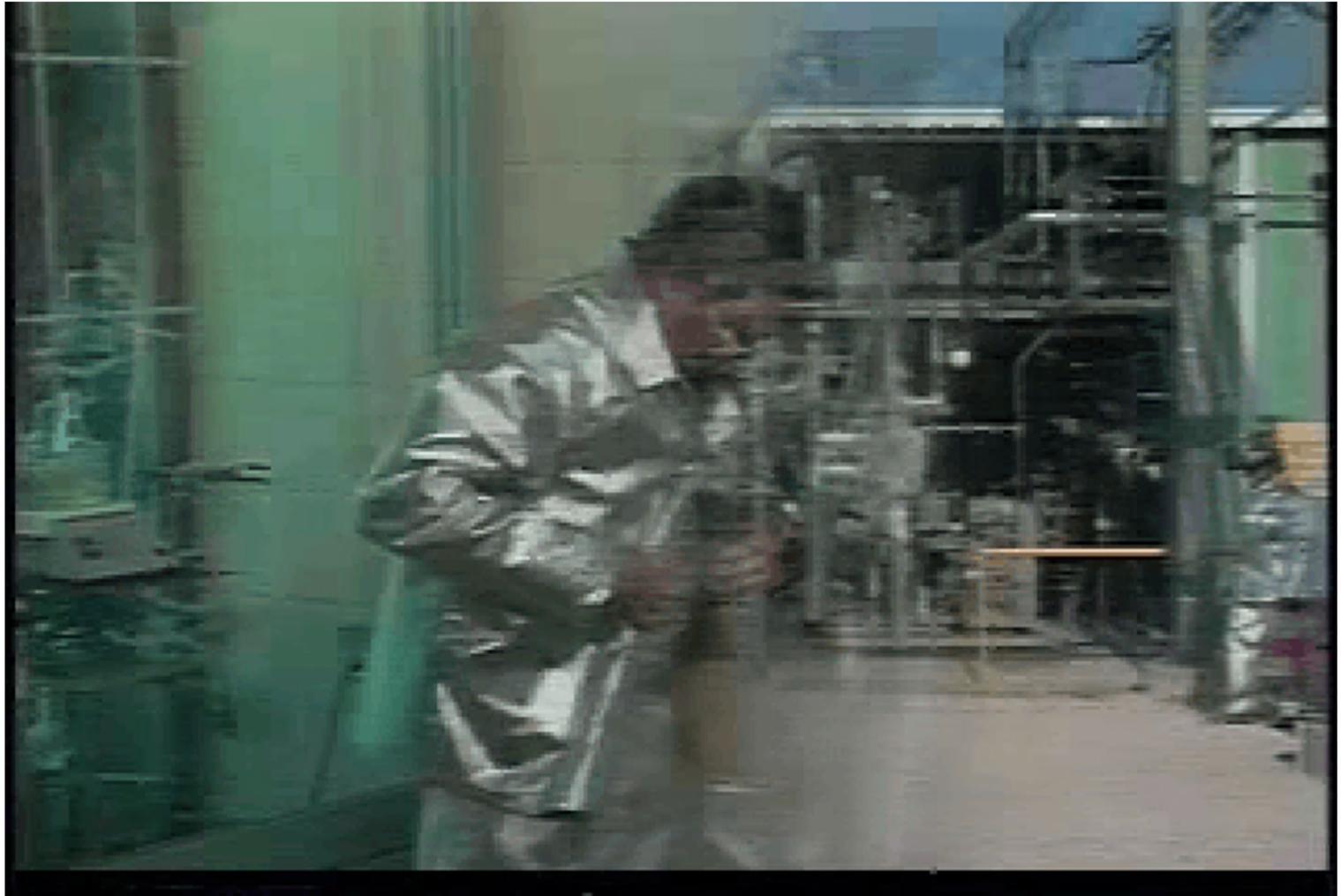
# Pyrophorics

- Substances that ignite spontaneously in air
- Flames are often extremely hot and bright, or even invisible

Example: white phosphorus



# Pyrophorics



# Oxidizers

- Readily transfers or yields oxygen during a chemical reaction
- Oxygen is a non-flammable/non-combustible gas
  - Oxygen is a common oxidizer, forming 21% of the air we breathe



# Organic Peroxides



- Unstable oxidizing compounds
  - form crystals spontaneously in some material (formed compounds are explosive, corrosive and/or toxic)
  - are shock and ignition source sensitive (burn very rapidly and intensely releasing toxic smoke)
  - tend to react with metals
  - are light sensitive (stored in darkness)
  - may decompose at room temperature (refrigerated)

Example: benzoyl peroxide, an ingredient used for treating acne

# Organic Peroxide + Fire

The Discovery logo is displayed in the top right corner of a black rectangular area. It consists of the word "Discovery" in a white, sans-serif font, with a small blue and white globe icon to its left.

# Corrosives

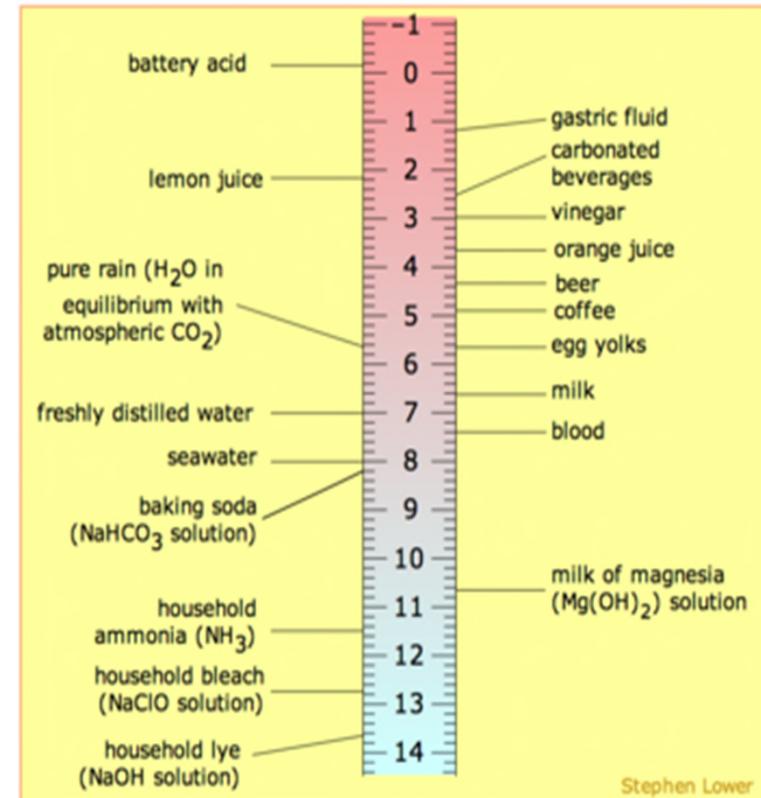


- reactive substance that destroys or irreversibly damages another substance it contacts
  - Common corrosives are acids, bases and oxidizers.
  - The stronger the acid or base, the more corrosive it is.



# Corrosives

- **pH** is a measure of acidity or basicity
  - Pure water (neutral): pH of **7**
  - Acids: low pH of **0 < 7**
  - Bases (caustics or alkalis): high pH of **+7 < 14**
- Combining acids with bases creates water, salt, and usually heat



# Corrosive Spill



# Asphyxiate



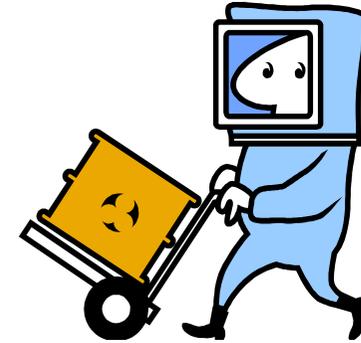
- Asphyxia: oxygen deficiency due to restricted breathing
- **Asphyxiant** atmospheres:
  - Inert (non-reactive) gases dilute or displace oxygen
    - Non-toxic, invisible and usually odorlessExamples: helium, nitrogen, LP Gas, argon, liquid nitrogen
  - Low or no oxygen
    - Consumed oxygen (by combustion or chemical reaction) or displaced by inert gas
  - Toxic gases, fumes or vapors
    - interaction with or damage to respiratory systemExample: carbon monoxide bonds to blood preventing the oxygen from being absorbed by cells

# Carbon Monoxide Accident



# Health Hazards

- Toxic Substances
- Irritants and Sensitizers
- Carcinogens
- Mutagenic and Teratogenic Biologicals
- Radioactive Substances

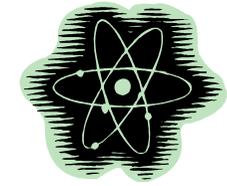


# Toxicity

- **Toxicity** - the degree to which a substance damages an organism
  - Acute exposure - single exposure (often high dose) which may result in severe harm or death
  - Chronic exposure - continuous (often low dose) over an extended period of time, usually months or years, which can cause long term irreversible effects.



# Toxic Substances



- There are generally three categories of toxic substances:
  - Chemical
    - Examples: asbestos, lead, mercury, methyl alcohol (in antifreeze), chlorine gas, poisons (e.g. rodenticide) and many medicines
  - Biological
    - Examples: bacteria (e.g. Anthrax) and viruses (e.g. Hepatitis)
  - Physical
    - Example: uranium, radon and other radioactive materials (i.e. substances emitting ionizing radiation)

# Irritants

- **Irritant substances** - chemicals causing reversible inflammatory effects on tissues upon contact
  - Skin irritant - dermatitis (skin rash or irritation)
  - Respiratory irritant - nose, throat and lung irritation (asthma or bronchitis)



# Sensitizers

- **Sensitizers** - substances that cause allergic reactions in tissues after repeated exposure.
- An immune response - some people may be sensitized while others may never be affected
- An allergic reaction (chemical hypersensitivity)

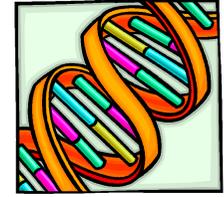


# Carcinogens



- A **carcinogen** is any substance or other agent (such as radiation) directly involved in causing cancer

# Mutagens & Teratogens

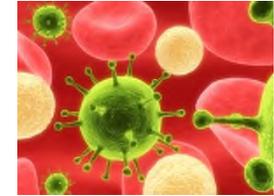


- Mutagens - substances that cause a mutation (change in DNA) in genes and chromosomes
  - Mutagens cause changes in human sperm or egg cells, passed on to successive generations
- Teratogens - substances that cause birth defects in developing fetus
  - Effects the fetus only and are not hereditary

# Biological Agents

- Organisms, bacteria, viruses, or toxins that effect people, livestock, and crops

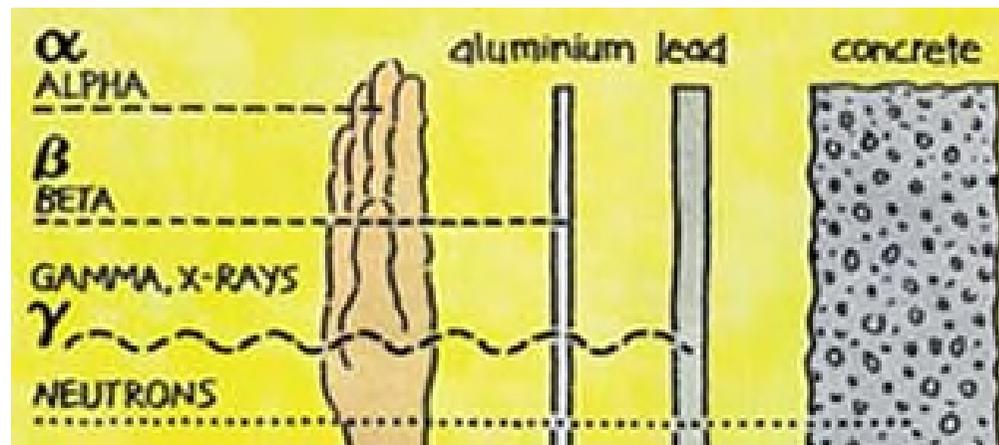
Example: anthrax, e-coli, salmonella, and bloodborne pathogens (e.g. HIV and hepatitis



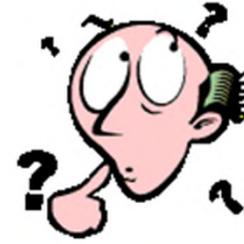
# Radioactive Substances

- Emit ionizing radiation (IR)
- Exposure to radiation causes microscopic damage to living tissue

Examples: Smoke Detectors, some medical devices



# Knowledge Review



- What is the definition of a Hazardous Material?
- Name 3 types of physical hazards?
- Name 3 types of health hazards?
- What is the difference between an irritant and a sensitizer?
- What hazard does a carcinogen pose?
- What hazard does a radioactive material pose?

# HAZARDOUS MATERIALS SAFETY



# Managing Hazardous Materials Safety



- Gain knowledge of hazardous materials in general
- Become familiar with OSHA, DOT & EPA industry standards relating to hazardous materials
- Understand potential chemical exposures
- Become aware of established chemical exposure prevention strategies
- Train in the correct use and handling of protections provided
- Follow established policies and procedures

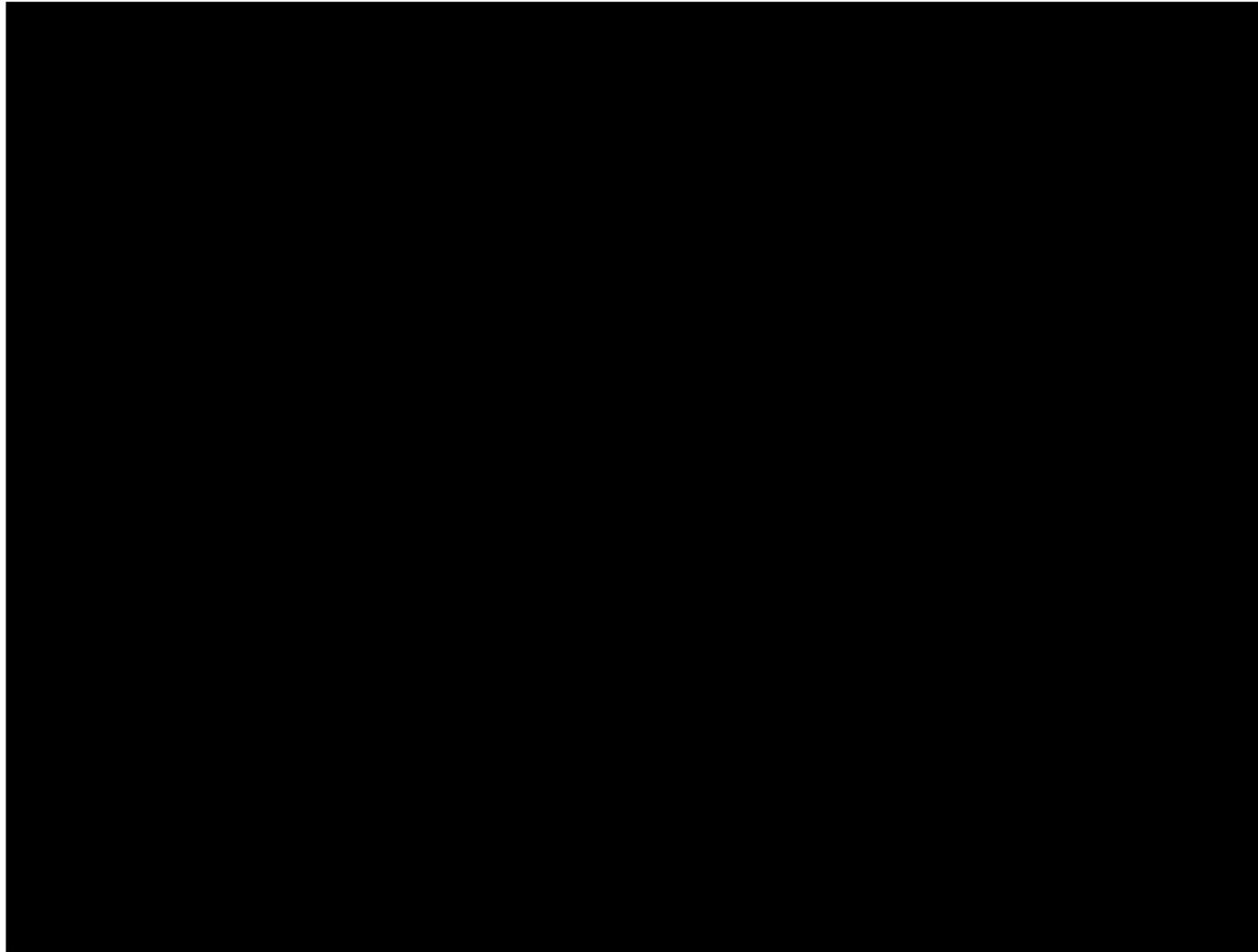
# What is Hazard Communication?

- OSHA's Hazard Communication Standard, 29 CFR 1910.1200, is based on the concept that workers have a **“right to know”**
  - identity and hazards of the chemicals they are exposed to
  - what protective measures are available to prevent adverse effects from occurring



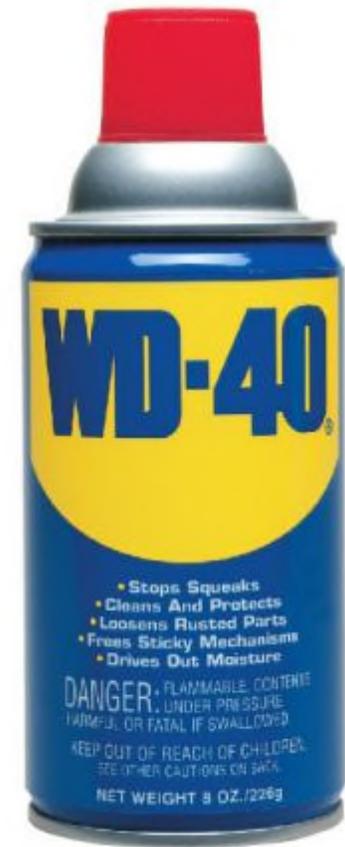


# Hazard Communication Program



# Identifying Hazardous Materials

- Product labeling and warnings
- Warning signs, symbols and pictograms
- DOT HAZMAT markings, labels and placards
- MSDS / SDS
- Manufacturer / distributor websites



# Globally Harmonized System

<b>GHS Pictograms</b>					
Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Hazard		Acute Toxicity (severe)		Flammables Self-Reactive Pyrophorics Self-Heating Emits Flammable Gas	
Environmental Toxicity		Irritant Derma/Skin Sensitizers Acute Toxicity (Harmful) Transient Target Organ Effects (narcotic or respiratory)		Oxidizers Organic Peroxides	
Corrosives		Gases under Pressure		Explosive Self-Reactive Organic Peroxides	

# Transportation Dangerous Goods & Hazardous Materials “HAZMAT”



CLASS 1-Explosives

CLASS 2- Gases

CLASS 3- Flammable liquids

CLASS 4- Flammable solids

CLASS 5- Oxidizers

CLASS 6- Toxic materials

CLASS 7- Radioactive materials

CLASS 8- Corrosive materials

CLASS 9- Miscellaneous dangerous goods

DANGEROUS- Indicates a mixed load of hazardous materials

# Material Safety Data Sheets (MSDS) Safety Data Sheets (SDS)

- Contains information on the potential hazards
- Prepared by the supplier or manufacturer of the material
- SDSs will gradually replace the MSDS and will standardized chemical information into 16 categories

 <b>Clorox Professional Products Company</b> 1221 Broadway Oakland, CA 94612 Tel: (510) 271-7500		<b>Material Safety Data Sheet</b>									
<b>I Product:</b> COMMERCIAL SOLUTIONS® ULTRA CLOROX® GERMICIDAL BLEACH I <b>Description:</b> CLEAR, LIGHT YELLOW LIQUID WITH CHLORINE ODOR											
<b>Other Designations</b>  EPA Reg. No. 67619-0 Sodium Hypochlorite Solution	<b>Distributor</b>  Clorox Sales Company 1221 Broadway Oakland, CA 94612	<b>Emergency Telephone Nos.</b>  For Medical Emergencies, call 1-800-445-1014 For Transportation Emergencies, call Chemtrec 1-800-424-9300									
<b>II Health Hazard Data</b>  DANGER: CORROSIVE. May cause severe irritation or damage to eyes and skin. Harmful if Swallowed. The following medical conditions may be aggravated by exposure to high concentrations of vapor or mist: head conditions or chronic respiratory problems such as asthma, chronic bronchitis, or obstructive lung disease. Some clinical reports suggest a low potential for sensitization upon exaggerated exposure to sodium hypochlorite, particularly on damaged or irritated skin. Routine clinical tests conducted on intact skin with Clorox Liquid Bleach found no sensitization in the test subjects. Under normal consumer use conditions the likelihood of any adverse health effects are low.  <b>FIRST AID:</b> <b>EYE CONTACT:</b> Rinse with plenty of water for at least 15 minutes. Get prompt medical attention. <b>SKIN CONTACT:</b> Wash skin thoroughly with soap and water. <b>INGESTION:</b> Drink large amounts of water. DO NOT induce vomiting. Call a physician or poison control center immediately. <b>INHALATION:</b> If breathing problems develop, remove to fresh air.		<b>III Hazardous Ingredients</b>  <table border="1"> <thead> <tr> <th>Ingredient</th> <th>Concentration</th> <th>Worker Exposure Limit</th> </tr> </thead> <tbody> <tr> <td>Sodium Hypochlorite CAS # 7681-62-9</td> <td>6.0 - 7.35%</td> <td>Not established</td> </tr> <tr> <td>Sodium hydroxide CAS # 1310-73-2</td> <td>&lt; 0.2%</td> <td>2 mg/m<sup>3</sup> TLV-STEL<sup>1</sup> 2 mg/m<sup>3</sup> PEL<sup>2</sup></td> </tr> </tbody> </table> TLV-STEL = ACGIH Threshold Limit Value - Short Term Exposure Limit PEL = OSHA Permissible Exposure Limit - Time Weighted Average  None of the ingredients in this product are on the IARC, NTP or OSHA carcinogen list.	Ingredient	Concentration	Worker Exposure Limit	Sodium Hypochlorite CAS # 7681-62-9	6.0 - 7.35%	Not established	Sodium hydroxide CAS # 1310-73-2	< 0.2%	2 mg/m <sup>3</sup> TLV-STEL <sup>1</sup> 2 mg/m <sup>3</sup> PEL <sup>2</sup>
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<b>IV Special Protection and Precautions</b>  <b>Usage Precautions:</b> Wear safety glasses. With repeated or prolonged use, wear nitrile, neoprene, or butyl rubber gloves. Wash after contact with product. Avoid breathing vapors. <b>Exposure Controls:</b> Use general ventilation to minimize exposure to vapor or mist. <b>Work Practices:</b> Avoid eye and skin contact and inhalation of vapor or mist. <b>KEEP OUT OF THE REACH OF CHILDREN.</b>		<b>V Transportation and Regulatory Data</b>  <b>DOT:</b> Not restricted per 49CFR172.101(c)(12)(iv). <b>MDG:</b> Not restricted per IMDG Code Page 0021 Paragraph 5.3.5. <b>ATA:</b> Not restricted per IATA D.G.R. Special provision A3. <b>REGULATORY INFORMATION:</b> This product is regulated under Sections 311/312. This product contains no chemicals regulated under Section 313 and contains sodium hypochlorite and sodium hydroxide which are regulated under Section 302/304/305/308/313. <b>TSCA Status:</b> All components of this product are on the TSCA Inventory.									
<b>VI Spill Procedures/Waste Disposal</b>  <b>Spill Procedure:</b> Absorb and containize. Wash residual down to sanitary sewer. Contact the sanitary treatment facility in advance to assure ability to process wash-down material. For sale of multiple products, responders should evaluate the MSDS's of the products for incompatibility with sodium hypochlorite. Breathing protection should be worn if enclosed, and/or poorly ventilated areas until hazard assessment is complete.  <b>Waste Disposal:</b> Dispose of in accordance with all applicable federal, state, and local regulations.		<b>VII Reactivity Data</b>  Stable under normal use and storage conditions. Strong oxidizing agent. Reacts with other household chemicals such as toilet bowl cleaners, rust removers, vinegar, acids or ammonia containing products to produce hazardous gases, such as chlorine and other chlorinated species. Prolonged contact with metal may cause pitting or discoloration.									
<b>VIII Fire and Explosion Data</b>  Not flammable or explosive. In a fire, cool containers to prevent rupture and release of sodium chlorate.		<b>IX Physical Data</b>  Boiling point: ..... 212°F/100°C (decomposes) Specific gravity (H <sub>2</sub> O=1, 21°C): ..... 1.10 Solubility in water: ..... Complete pH: ..... 11.4									
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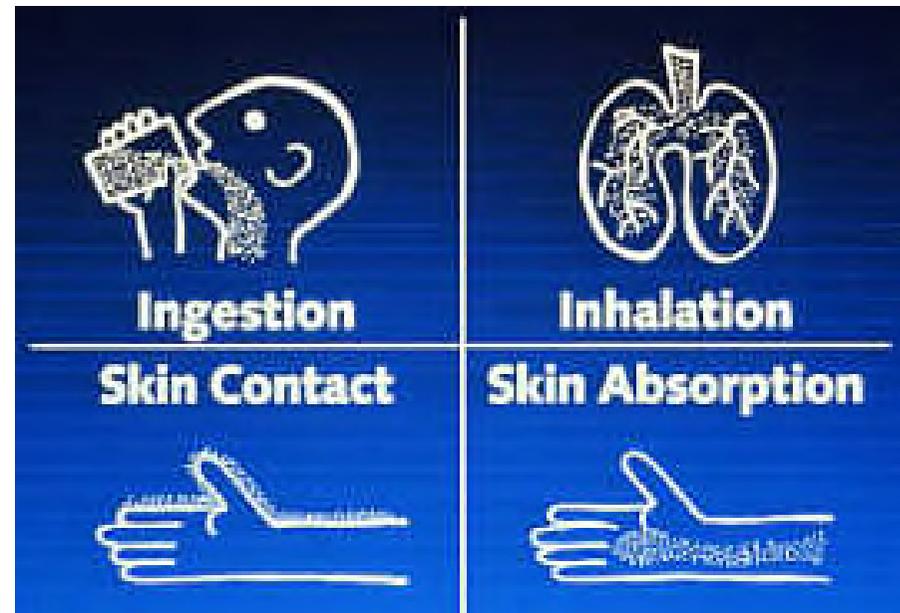
# Finding product information

Group exercise

MSDS, SDS, Product Labels, Internet

# Potential Exposures

- Four main ways hazardous wastes can enter your body
  - ingestion
  - inhalation
  - direct contact
    - injection
    - absorption



# Routes of Exposure

- **Swallowing or eating (ingestion)**
  - Accidentally by touching food products without first washing hands

Example: Eating a donut without removing your gloves after handling many chemical products



# Routes of Exposure

- **Breathing into the lungs (inhalation)**

- Breathing chemical fumes, mist, dust and gases

Example: Spraying pesticides without using appropriate respiratory protection



# Routes of Exposure

- **Touching or direct contact with the skin (absorption)**

- Some chemicals seep into the skin quickly while others enter through open wounds

Example: Having a chemical drip from a leaking container onto your skin



# Routes of Exposure

- **Puncture of the skin (injection):**
  - Needle pricks from syringes, pieces of glass or metal

Example: Cutting your finger on a piece of glass from a broken mercury thermometer.



# Symptoms of Exposure

- Symptoms of hazardous materials over-exposures may include
  - Confusion, Anxiety, Dizziness, Blurred Vision, Skin Color Change, Burns, Cough, Chest Pain, Numbness of Extremities, Nausea, Vomiting, Abdominal Cramps, etc...
  - Immediately notify Site Commander or staff



# Preventing Exposures



- Hazard assessment completed to protect workers – Exposure controls include:
  - Engineering controls – removed major hazards by installing equipment (design and ventilation)
  - Administrative controls – established operating procedures and policies
  - Personal protective equipment (PPE) – provided where no other controls were possible or practical

# Preventing Exposures



- Wear all required PPE at collection events
  - PPE use is strictly enforced by staff
  - Replace your PPE if it becomes damaged or contaminated
  - Frequently replace your gloves as they become soiled
  - Remove your gloves, vest and apron when leaving the site (including during rest and bathroom breaks)
  - Remove your gloves and vest when eating or drinking in break areas

# Preventing Exposures



- Smoking - prohibited within 50 feet of a collection
- Chewing tobacco or gum, biting fingernails, eating or drinking are strictly forbidden while collecting, packaging, labeling, transferring, or otherwise handling HHW
- Read labels on HHW to determine hazard warnings
- Place broken or cracked containers in a plastic bag and tape shut
- **DO NOT** rush while unloading or sorting
- Stay calm and focused
- Follow policies and procedures

# Knowledge Review



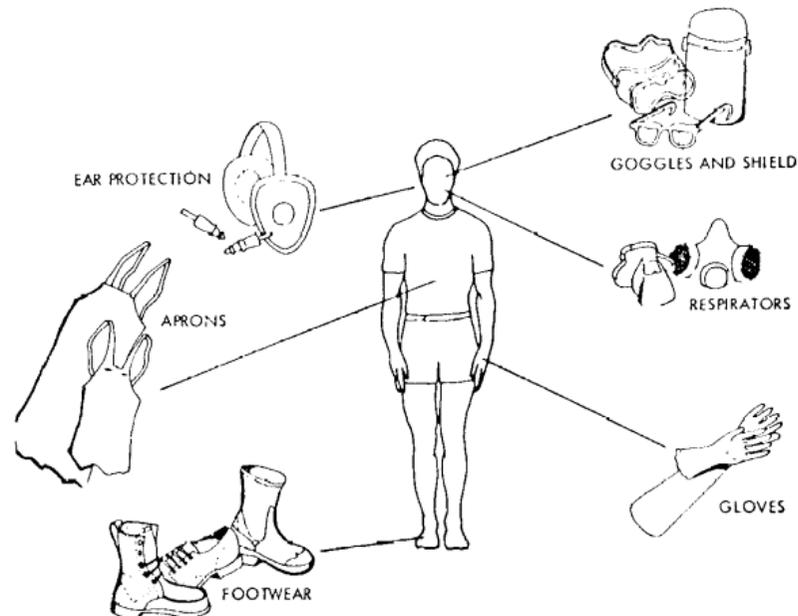
- Why do we need the Hazard Communication program?
- Why are labels important?
- What do DOT HAZMAT diamond labels identify?
- What is an MSDS?
- Where can MSDS be found?
  - List the four routes of exposure?
  - List five ways exposures can be prevented?

# PERSONAL PROTECTIVE EQUIPMENT



# Personal Protective Equipment

- Personal Protective Equipment (PPE) includes all clothing and other work accessories designed to create a personal barrier against workplace hazards





# Personal Protective Equipment (PPE)

- PPE provided at no cost
- Instruction provided on proper fit, maintenance, sanitation, use, limitations and disposal
- Required PPE includes:
  - safety glasses, chemical resistant aprons, nitrile gloves, safety vests, long sleeve shirts, hats and closed-toe shoes

# Eye/Face PPE

- Protection is required against hazards such as dust, flying particles, chemicals, intense light and any other hazard
  - **Safety glasses** provided must be worn at all times in HHW working phases except in break/rest areas



# Safety Glasses

- Protect against moderate impact from particles and flying objects
  - metal or plastic frames (clear or sunshades) and most have side shields
  - Prescription lenses available
  - Not good for protection against fine dust, liquid splashes and vapors
- Approved glasses will have a marking (Z87.1 symbol)



# Prescription Safety Glasses

- Ordinary wear eyeglasses DO NOT provide the required protection against workplace hazards
- Proper choices:
  - **Prescription safety glasses** with side shields and protective lenses meeting ANSI Z87.1
  - Glasses/goggles fitting over corrective eyeglasses – must not disturb proper alignment
  - Goggles may incorporate corrective lenses



# Safety Goggles

- Used to protect eyes, eye sockets, and the facial area immediately surrounding the eyes from impact, dust, vapors and liquid splashes
  - Some goggles fit over corrective lenses
  - Anti-fogging cleaners and coatings are available
  - Clear or shaded lenses available
  - Approved goggles (Z87.1 symbol)
- Not provided at HHW events



# Face Shields

- Protect faces from nuisance dusts and potential splashes or sprays of hazardous or non-hazardous liquids
  - Most do not protect from impact hazards
- Safety glasses or goggles supplemented by a face shield - protection against hazardous chemicals, blood and other infectious liquids



# Hand Protection

- Hand and arm PPE protect against hazards such as sharp objects and chemical hazards
  - **Nitrile gloves** shall be worn when handling chemicals
  - **Heavy work gloves** shall be worn for moving equipment or closed shipping containers



# Body Protective Clothing

- **Heavy plastic apron** protects everyday clothing from hazardous chemicals contamination
- **Long sleeve shirts** protects from sun exposure
- **Safety vest** protects from vehicle and traffic hazards



# High Visibility PPE

- Volunteers engaged in traffic control or exposed to vehicular traffic must wear high-visibility safety vests



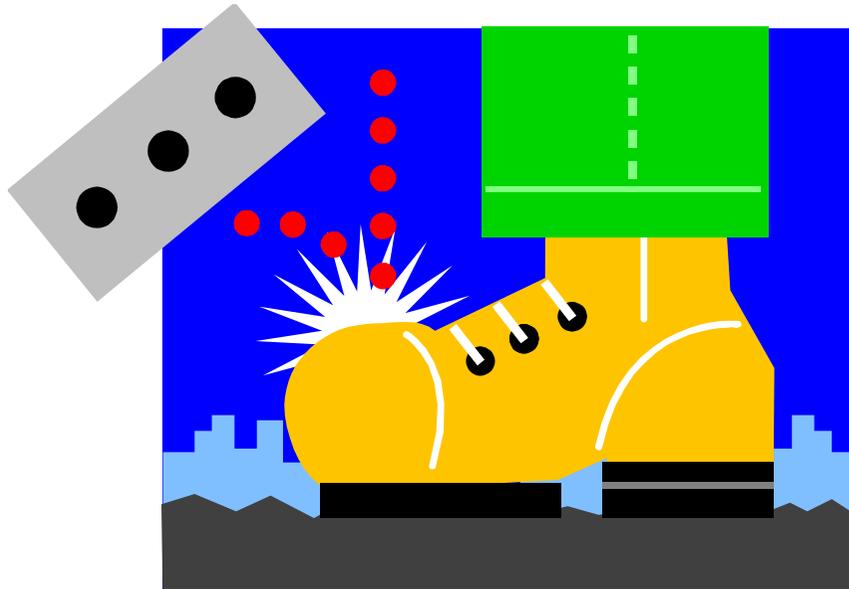
# Proper Footwear

- **Closed toe shoes** protect against hazards such as dropped items, stubbed toes, insects, and being contaminated by hazardous chemicals
  - Comfortable shoes are highly recommended
  - **DO NOT** wear open toe shoes



# Safety Shoes

- **Steel-toes** are required to move drums & operate dollies or pallet jacks – protect feet



# Head Protection

- Highly encourage hats – prevent sunburn and provide personal shade to help keep cool
  - Light colored, breathable, and wide brimmed hats



# When to Remove PPE



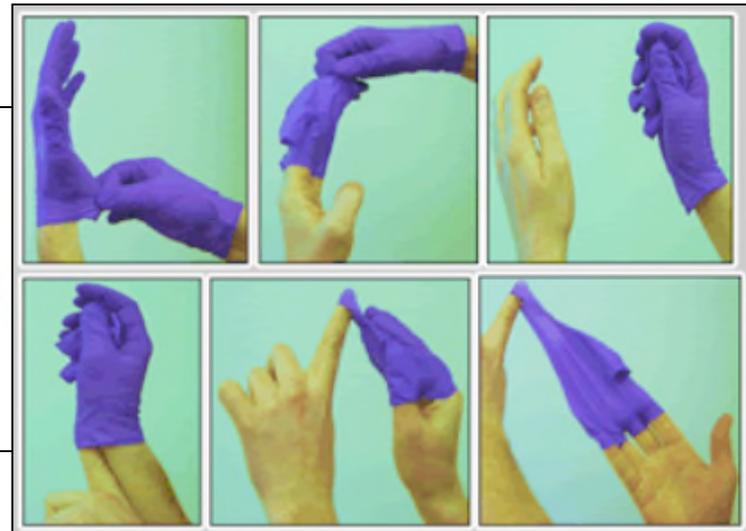
- Replace PPE if damaged or contaminated
  - Safety glasses may be properly cleaned
- Remove gloves to eat or drink in break area
  - You may leave your vest and apron on if not contaminated
- Remove gloves and apron when leaving site
  - Includes leaving to use the restroom
  - **DO NOT** remove safety vest to leave to restroom – you may possibly walk through traffic lanes
  - **Do** remove safety vest before entering restroom

# Removing Contaminated Gloves

- Frequently replace gloves – when torn or contaminated with chemical residues
- Proper removal:

## GLOVES

Outside of gloves is contaminated!  
Grasp outside of glove with opposite gloved hand; peel off  
Hold removed glove in gloved hand  
Slide fingers of ungloved hand under remaining glove at wrist  
Peel glove off over first glove  
Discard gloves in waste container



# Where to Dispose of PPE

- Sort contaminated PPE (disposable & reusable)
  - Toss gloves and plastic apron in trash
  - Reusable items include safety glasses, vests and heavy gloves – store safety glasses in zip lock baggie (volunteer name) and fold safety vest in PPE box



# Knowledge Review

- List all required PPE worn by volunteers?
- Describe two types of protective eyewear?
- Describe two types of protective gloves?
- Describe two types of body PPE?
- Describe improper footwear?
- Explain when PPE must be removed?
- Explain how to remove contaminated PPE?



# COLLECTION EVENTS



# What Is Household Hazardous Waste?



The U.S. Environmental Protection Agency (EPA) defines HHW as

**“leftover household products that contain corrosive, toxic, ignitable or reactive ingredients.”**



## Removing HHW from Circulation

- **Recycle** – oil, antifreeze, paint, reusable items, etc.
- **Reclaim** – batteries, fluorescent bulbs, thermometers, etc.
- **Dispose** – pesticides, paint strippers, wood preservatives, etc.

*98% Recycling Rate*



# Educating the Public

- Personal advice
- Refer to Recycling Directory
  - [www.cityoftucson.org/TCB](http://www.cityoftucson.org/TCB)
- Distribute HHW fact sheets



# Commercial or Business Waste

- Do not accept – How to Identify?
- Defer to staff for assistance
- Refer to the Small Business Waste Assistance Program (SBWAP)



# Collections – Where and When

- 2 main sites
- 2 Regular outreach sites
- Remote outreach sites
- ABOP sites – Antifreeze, Batteries, Oil, & Paint
- Home Pick-up Program
- Drop & Swap & Latex Paint Program
- Business Program (SBWAP)



# Working a Collection Site

- Be on time - 1/2 hour before start
  - Group meeting with the Site Commander
  - Participate in site safety meeting
  - Determine task assignments
  - Sign in and receive personal protective equipment (PPE)
  - Familiarize with set up area
  - Review Site Safety Plan
  - Call 520-690-5749 if unable to report to an event

# Site Safety Meeting

- Held before collection events to discuss the following:
  - Each person's role
  - Location of safety equipment
  - Contingency plans
  - Waste packing guidelines
  - Chemical/Physical hazards
  - Personal protective equipment requirements
  - Safety precautions/work practices





# GOOP

- **G**reet the public
- **O**btain information
- **O**bserve the waste
- **P**ackage the waste

# Step 1 - Greet the Public

- Prompt and pleasant
  - Encourages participation
  - Better informed about HHW
  - Encourages referrals



# Remote Collection Event

- Survey taken by greeter at the entrance to the collection facility





# HHW Drop Off Point

- Direct vehicles to staging area
- Upon approaching the vehicle, ask the participant to:
  - Place vehicle in park
  - Turn off the engine
  - Keep children and pets controlled inside car
  - Request that driver open the vehicle and point out donated items



## Step 2 - Obtain and Observe

- Waste identification and classification
  - *This is the most critical waste identification and hazard classification step*
- Unknowns – Identify odd items, unlabeled items, leaking items, etc.

# HHW Handling Procedure

- Before removing items from a car, ask the participant what they have brought to the collection event



# Listen and Observe

- Look at the condition of the containers, look for labels or markings, look for signs of spillage and look for prohibited waste



# Labeling Problems...

- What's in the containers?



# Labeling Problems...

- What's usually in this type of bottle?



# Labeling Problems...

- Hissing, heat, fumes or cannot identify a material/waste - **DO NOT** move the container and immediately notify the Site Commander or staff



# Labeling Problems...

- Precipitate inside or crystals around the cap of a container - **DO NOT further handle the container and immediately notify the Site Commander or staff**



# Material Handling

- Do not handle any waste that you are uncomfortable with
- Notify the Site Commander or staff





# HHW Unknowns

- Occasionally materials are clearly household wastes, but nothing else is known
  - We can take these and staff will categorize them using the HAZCAT equipment available at collection site
  - Label the container with whatever information you have and accept it
  - Communicate to staff and sorters



# Leaking Containers



- If a waste container is found leaking, notify staff that there is a “leaker” and
  - Immediately inform the driver and the Site Commander or a staff member
  - A staff member will respond and may request your assistance to clean up/contain the spill
- Staff have the proper training to clean up spills but you may “assist” only as directed
- If you are unsure... ASK!

# Prohibited Waste



- You must reject the waste if you find that it is Prohibited Waste, including:
  - Infectious (including sharps containers)
  - Medications
  - Radioactive
  - Explosive (blasting caps and dynamite)
  - Munitions (including bullets and shells) or
  - Commercial compressed gas
    - NOTE: does not include aerosol cans or barbecue propane cylinders
- Request assistance from Program staff

# HHW Handling Procedure

- You must reject the waste if you see any indication that the waste is commercial
  - Attached 6" by 6" HAZARDOUS WASTE label or DOT shipping manifest
  - Containers larger than household commodities
  - Several full containers of the same material
- Have a program staff discuss the matter with the contributor



# Material Handling - Unloading

- Carefully remove the waste and place it on a cart for transport





## **Step 3 – P**ackage the Waste

- Roll the cart(s) to proper areas (sorting tables, paint trucks, etc.)
- Return non-contaminated containers (boxes, totes, used oil containers, etc.)
- Thank the participant and encourage them to return
- Sort the waste into the appropriate areas

# Material Sorting Tables

- Check the container labeling...even if you believe you are familiar with the material...to ensure its contents
- Place leakers in a plastic bag and use duct tape to close the bag



# Material Sorting

- Four main categories of HHW
  - Oxidizers
  - Flammables
  - Corrosives
  - Poisons or Toxics



# Recognizing Oxidizers



- Oxidizers release oxygen and promote combustion – common examples:
  - pool chlorine & shock - (calcium hypochlorite, etc.)
  - ammonium nitrate (35-0-0 fertilizer); potassium nitrate
  - "solid-ox" (a chemical heating agent)
  - hydrogen peroxide (>8% - household type is 3%)
  - some epoxy or fiberglass hardeners (not the resins)
  - methyl ethyl ketone peroxide (MEKP)
  - nitrates, chlorates, perchlorates, peroxides
  - bleach, some cosmetics & tree killing solids



# Recognizing Oxidizers



# Recognizing Oxidizers



# Tips Handling Oxidizers

- Separate solid and liquid oxidizers
- Oxidizers need to be isolated first
- The simplest of these is oxygen gas in a cylinder, but most oxidizers received come in solid form
- Never place next to flammable and combustible materials

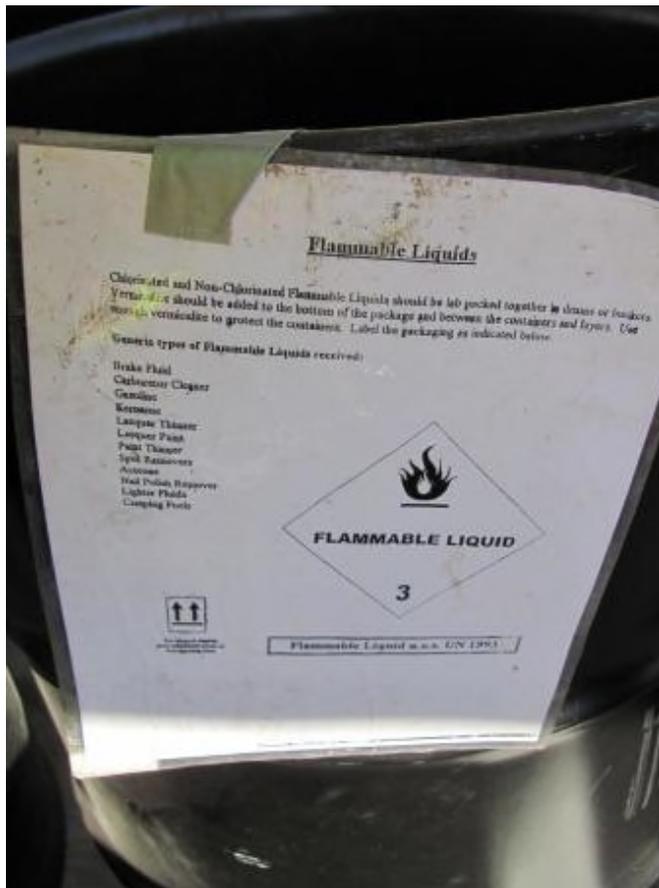


# Recognizing Flammables



- Flammable household products include:
  - automotive brake fluid
  - oil based stains, paints, thinners and some paint strippers
  - lighter fluid, lighters, "Coleman" fuel
  - kerosene, turpentine, naphtha, petroleum distillates
  - methyl ethyl ketone, benzene, toluene, ethanol, methanol, propanol & isopropanol
  - tree sealant, PVC pipe glue & other adhesives
  - epoxies & body filler
  - gasoline treatment & some carburetor cleaners

# Recognizing Flammables



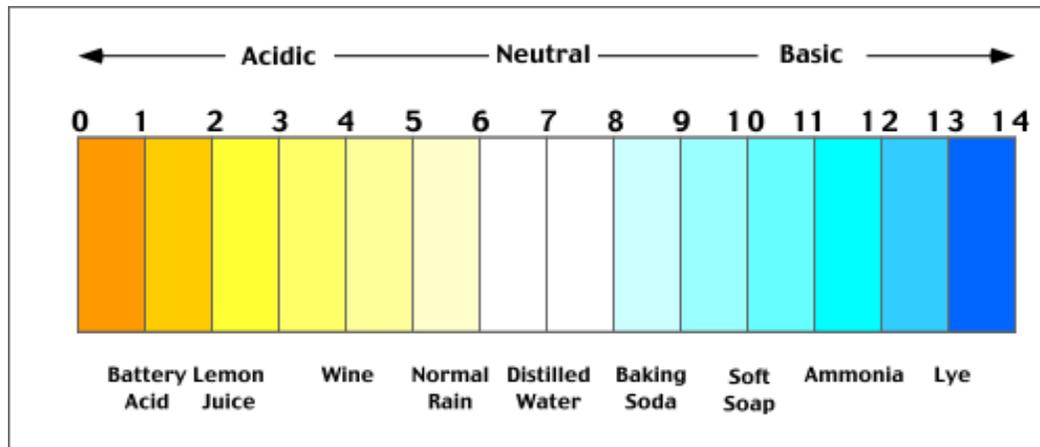


# Tips Handling Flammables

- Separate liquid flammables and aerosols
- Many flammable products are also poisonous
  - Since flammable liquids easily spill and ignite, generally be concerned about its flammability before its toxicity
- Handle benzene with extra care (carcinogen)
- Never package with oxidizers
- DO NOT pull buttons off of aerosol cans
- Take extra care when handling ethers as many can form explosive peroxides upon exposure to air – Immediately notify Site Commander or staff if an ether container is received

# Recognizing Corrosives

- Corrosives have extreme pH's that corrode other materials, such as steel, glass, and skin
  - Always segregate corrosive materials into **acids** and **bases**



# Recognizing Corrosives (Acids)

- Acids – common household types:
  - muriatic acid (concrete cleaning, pool acid)
  - phosphoric acid (technical grade)
  - household batteries (not alkaline) only if leaking
  - acetic acid (photochemical) - organic
  - scale, lime and rust deposit removers
  - drain openers (sulfuric acid based)
  - nitric acid & chromic acid
  - some hobby chemicals
  - car batteries



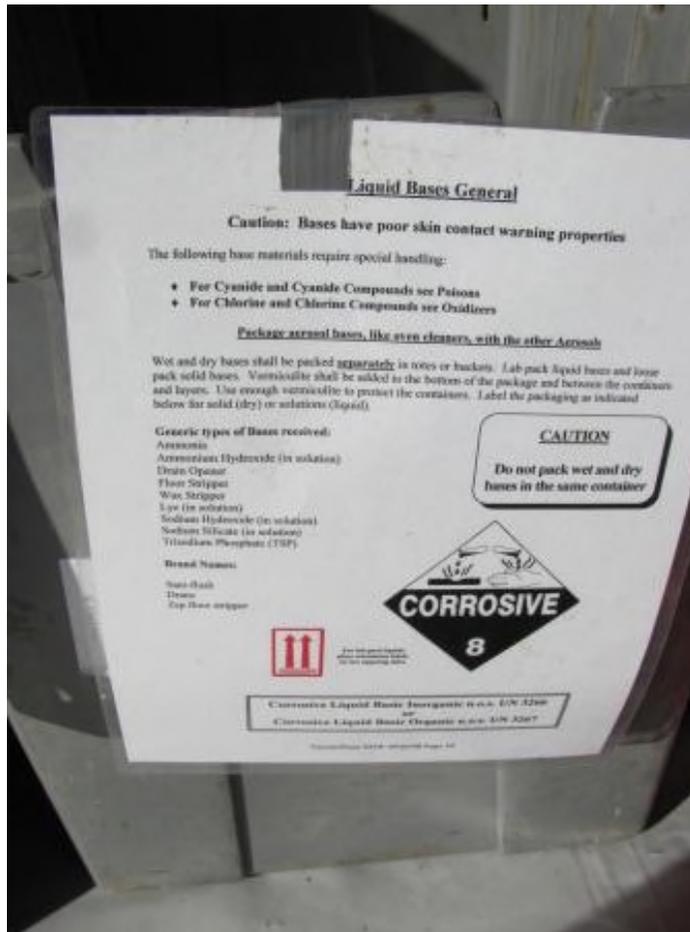




# Recognizing Corrosives (Bases)

- **Bases (also called alkalines or caustics) –**
  - lye, sodium hydroxide, potassium hydroxide
  - lime, plaster of paris
  - ammonia containing cleaners & floor strippers
  - bleach (laundry bleach, bathroom cleanser)
  - alkaline batteries, if leaking
  - oven cleaners
  - Liquid or crystals drain openers (sodium hydroxide)
  - "Nair" hair removers

# Recognizing Corrosives (Bases)





# Tips Handling Corrosives

- NEVER package cyanide compounds with acids
- ALWAYS separate liquids from solids
- Corrosives can seriously burn body tissue, cause dermatitis, and damage eyes, respiratory tract and mucous membranes
- Many corrosives cause delayed injury (bases)
- Place corrosive aerosols in aerosol drum
- Any body parts exposed to corrosives must be washed immediately and eyes flushed for at least 20 minutes

# Recognizing Poisons



- Poisons or Toxics include:
  - pesticides & herbicides
  - fertilizers
  - mothballs, flea collars, fly paper
  - chlorinated benzene or phenol derivatives
  - wood preservatives
  - products containing metals: arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc
  - any unclassifiable organic materials

# Recognizing Poisons





# Tips Handling Poisons

- Separate liquid and solid poisons
- Some paint strippers (methylene chloride - based) are placed in liquid poison drum
- Aerosol poisons are also flammable – place in aerosol drum
- Some pesticides are cyanides (sodium cyanide – packaged & shipped separately

# Miscellaneous Wastes

- Unknowns
- Paints
- Batteries
- Waste Oil and Filters
- Antifreeze
- Road Flares
- Mercury
- Smoke Detectors
- Fluorescent Lamps
- Electronics
- Ink & Toner
- Photo Chemicals
- Soaps and Waxes
- Other Products



# Unknowns

- **DO NOT attempt to identify an unknown by touching or smelling the material**
  - Unknown materials may only be tested/identified and sorted by staff
  - Place unknowns in designated area



# Paints

- Latex and oil-based paint (stains, varnish, primers, etc.) - sorted in separate wire baskets
- At outreach events load directly onto trucks
- Weak or leaking paint containers - place in a plastic bag, tote or bucket



# Lead Acid Batteries

- Non-leaking lead acid batteries - sorted into a battery box (terminals must not touch other terminals or metal)
- Leaking lead acid batteries - placed in a tote or bucket
- **Notify Site Commander or Staff of leaks**



# Dry Batteries

- Rechargeable, button & sealed lead-acid batteries - sorted into a 5-gallon bucket
- Alkaline batteries – tossed in trash



# Used Oil

- Used oil - poured into a 55-gallon drum
- Used oil suspected of containing solvents - packaged separately
- Unopened oil containers - placed in flammable liquid drum for recycling



# Oil Filters

- Oil filters - placed into a bucket or tote



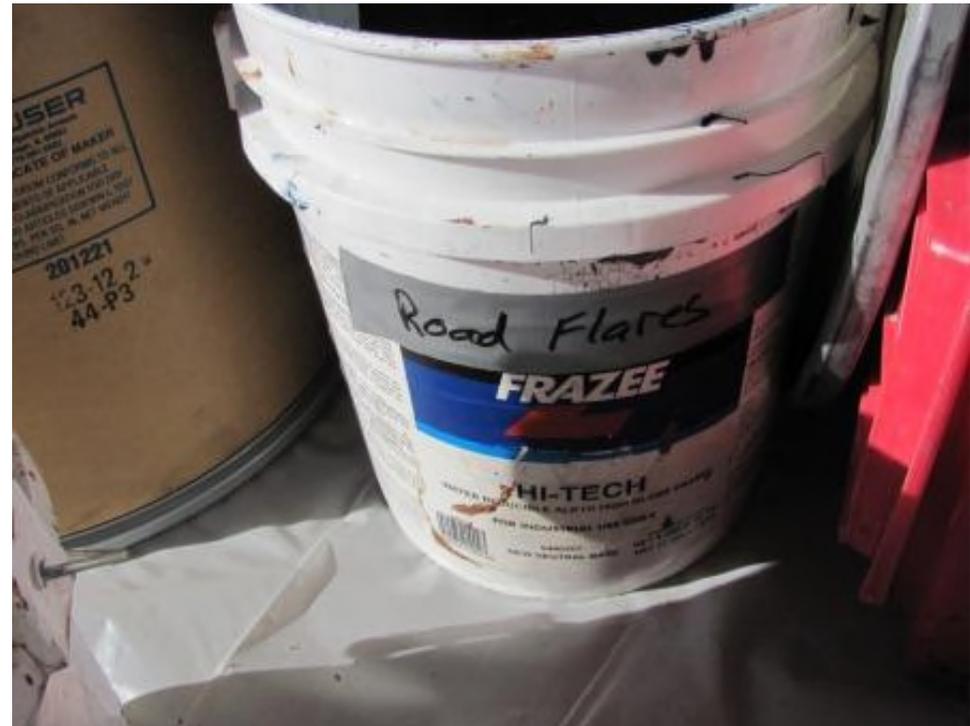
# Antifreeze

- Antifreeze - poured into a 55-gallon drum
- Unopened antifreeze containers - placed in flammable liquid drum for recycling



# Road Flares

- Road flares - placed into a tote or bucket



# Mercury

- Mercury containing thermometers, thermostats, liquid mercury (elemental) and medical devices - packaged in bucket or tote
- Mercury containing compounds (e.g., mercuric chloride) – packaged together



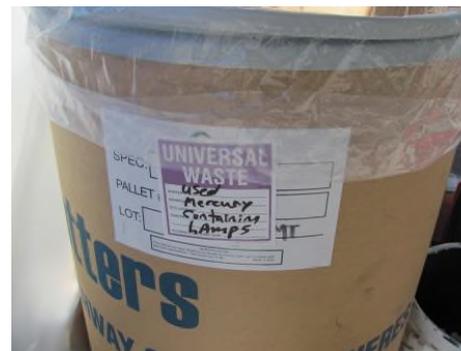
# Mercury Spills

- Spill kits must be used for cleaning up liquid mercury spills
- Immediately notify the Site Commander or staff



# Mercury Lamps

- Fluorescent lamps (4' or 8' tubes) - placed in cardboard cylinders or lamp boxes
- Smaller fluorescent lamps (CFL's) – separate into a bucket, tote or cardboard cylinder
- Handle with care to prevent breakage



# Computers & Peripherals

- Computers and peripherals (CPU, monitor, printer, key board, mouse, etc.)
- **Not accepted** – TV's and other electronics
- RISE Inc. partners at selected events – accept other items and may charge fees



# Ink & Toner

- Ink or toner cartridges - placed into a bucket or tote



# Photo Chemicals

- Packaged as Organic Acids (Fixers & Stop Bath) or Bases (Developers)
- Large amounts of photo chemicals can be packaged separately into a bucket or tote
- Some solid photo chemicals are cyanides – packaged & shipped separately



# Soaps and Waxes

- Generic types include:
  - Bar and Liquid Soaps
  - Auto Wax and Polishes
  - Floor Wax & Sealers
  - Laundry Detergents
  - Rug Shampoo
  - Window Cleaners
  - Hydrogen Peroxide (household)
  - Disinfectants
  - “Navel Jelly” (phosphoric acid)
  - Cleaners (e.g. 409, Mr. Clean, Spic-n-span)





# Other Products & Tips

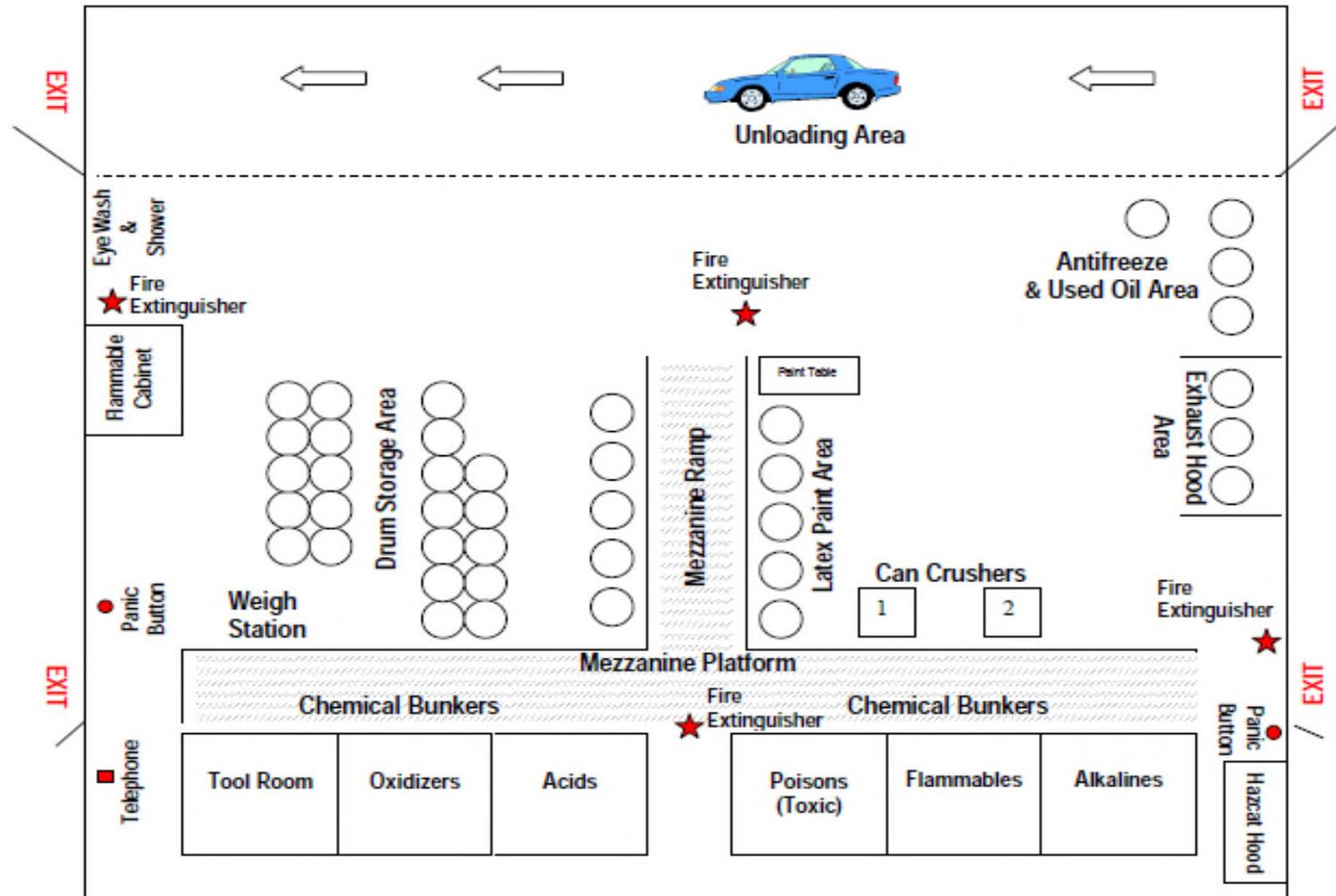
- Barbeque propane cylinders - loaded on trucks
- Propane camping bottles – packed in aerosol drum
- Butane cylinders – packed in aerosol drum
- Oxygen gas (oxidizer) cylinders – loaded on trucks
- Fire extinguishers – packed in aerosol drum
- Smoke alarms (radioactive) – disburse in trash
- Cyanide compounds – packaged separately
- Conventional recyclables – cardboard & plastics

# “Main” Collection Site

- HHW sorting areas clearly marked



# Sweetwater "Main" Collection Site



# “Main” Collection Site

- Car stopped inside collection building



# “Main” Collection Site

- HHW unloaded onto cart and rolled to sorting area



# “Main” Collection Site

- Drop & Swap & Recycled Latex Paint



# Remote Collection Event

- Sorting process in action



# Remote Collection Event

- Bulking process in action





# Packaging for Transport

- Consolidate collected containers into a suitable container preserving segregation
- Secure lids
- Ensure ALL containers are labeled
- Use drum dollies to move drums  
*(steel toed boots required)*
- Use materials carts to move full containers  
(buckets & totes)

# Site Breakdown

- Once a collection event has ended volunteers may stay to help with waste packaging, loading and clean-up
- Follow staff instructions to the letter





# Closing a Collection Site

- Close traffic lanes with traffic cones
- PPE – throw in trash (aprons & gloves)
- PPE – store safety glasses w/name
- Wash-up as needed – hand wash station
- Check out Drop & Swap items  
*(waiver/indemnification form)*
- Complete volunteer sign in/out sheet

# GENERAL SAFETY PRACTICES - HHW COLLECTION SITES



# Collection Site Hazards



- **UNINTENDED EXPOSURE** to hazardous materials
- **PHYSICAL HAZARDS**
- **BIOLOGICAL HAZARDS**
- **THERMAL HAZARDS**

# Slips Trips and Falls

- Poor housekeeping
- Low profile objects
- Inadequate lighting
- Incorrect footwear
- Carrying oversized objects
- Walking too fast, running or changing direction quickly
- Wearing sunglasses in low light areas



# Housekeeping

- Clean and orderly workplace - “clean, pick up, organize as you go”



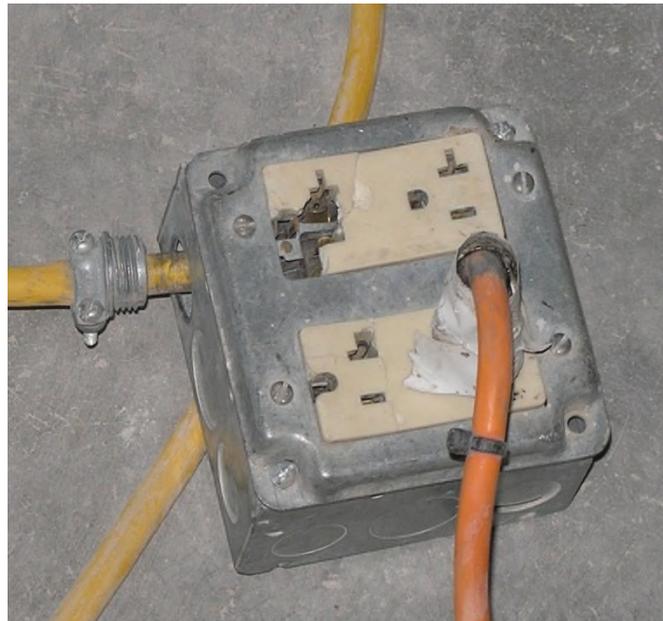
# Floor Housekeeping

- Keep work areas and walkways clear
- Maintain floors in a clean, dry and trip-free condition



# Safe Equipment & Tools

- **DO NOT** use damaged/defective equipment/tools
- Use power tools and machinery as instructed
- Promptly report damaged equipment to staff



# Flammable Liquids Safety

- Package or store in appropriate containers
- Pour/bulk only in designated containers in exhaust hood
- Immediately notify staff of spills



# Fire Extinguishers

- Fire extinguishers are clearly marked
- Portable units are provided at mobile events
- **DO NOT** block access
- **ONLY** trained staff may use in emergency



# First Aid & Medical

- Provided by personnel trained in FA/CPR/AED
- Medical facility nearby
- 9-1-1 emergency
- First aid supplies on-site



# Emergency Flushing Facilities

- Eyes or skin exposed to corrosive chemicals (e.g. bleach or acid) must be flushed with water
- Permanent safety eye wash and shower
- Portable eye wash solution bottles
- Restroom facilities



# Potable Water & Refreshments

- Potable water – eat!
- No common drinking cups or igloos allowed!
- Electrolyte replenishing drinks – drink!
- Snacks – eat!



# Managing Fatigue

- Rest break - every hour
- Extreme heat conditions - take additional breaks
- Use shade canopies
- Drink and eat snacks
- If you become fatigued - notify Staff or Site Commander



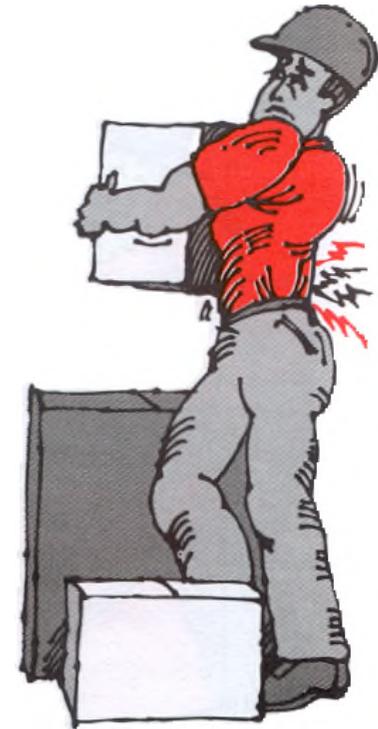
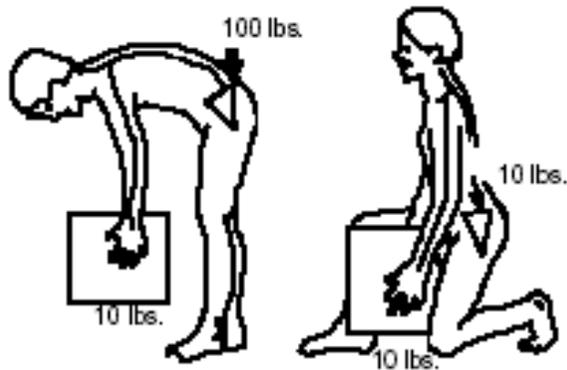
# Preventing Sunburn

- Wear sunscreen - minimum SPF 15
- Wear appropriate clothing & PPE



# Back Safety

- Major factors leading to injury
  - Position – improper lifting
  - Force – lifting too much weight
  - Repetition – too many lifts





# Preventing Back Injury

- Use proper equipment – move & lift
- Safe lifting:
  - Ensure item is not too heavy
  - Place feet correctly
  - Bend knees - not at waist
  - Maintain natural spine curvature
  - Use correct grasp
  - Keep load close to body
  - Keep back as straight as possible

# Five Activities That Could Injure The Back



- Lifting/Lowering
- Pushing/Pulling
- Twisting
- Carrying
- Holding



# Knowledge Review

- List three ways to prevent slips/trips/falls?
- Describe good housekeeping?
- List three safety rules for tools and/or equipment?
- List three types of required emergency equipment?
- Explain what to do if you feel fatigued?
- List two ways to prevent sunburns?
- List three major factors causing back injuries?
- Describe the correct way to lift or move?
- List three activities that cause back injuries?





# Biological Hazards

- **Blood-born Pathogens – CAUTION - avoid needles, syringes and sharps**
  - Needle pricks can transfer pathogenic microorganism from biological fluids (hepatitis B (HBV), hepatitis C (HCV), etc.)
- **Insects and reptiles – CAUTION - avoid spiders, biting and stinging insects, mosquitoes and small mammals (black widows & scorpions, mosquitos, Africanized bees and snakes)**

# Black Widow Spiders

- Black Widow Venom - potent neurotoxin
- Prefer dark areas – may hide in stored boxes (sheds or porches)
- Bites usually result in uncomfortable but not life-threatening symptoms
- **IMMEDIATELY** notify Staff or Site Commander if bitten – possible allergic reaction



# Scorpions

- Bark Scorpion Venom - highly poisonous
- Active April-October - nocturnal but hide in dark places clinging upside down
- Stings - very painful (majority do not require special medical treatment)
- **IMMEDIATELY** notify Staff or Site Commander



# Scorpions



# Mosquitos

- Some species transmit diseases - encephalitis, dengue fever, and West Nile virus
- Bites - annoying localized swelling and itching
- Personal protection - insect repellents
- **IMMEDIATELY** notify Staff or Site Commander



# Africanized Honey Bees

- Hives may be found in outside areas
- Very protective of colony - react if threatened or disturbed
- May swarm - establish new nests and move their entire colony
- Be alert for bees acting strangely
- **IMMEDIATELY** notify Staff or Site Commander - allergic reaction, toxic response and infection risks



# Western Diamondback Rattlesnake

- Largest and most common species in AZ
- Venom (hemotoxin) - destroys blood & walls of blood vessels
- Rattlesnake bites - painful with severe swelling
  - 85% below knee & 50% “dry” or no venom injection
- **Don't bother snakes and they won't bother you!**



# Western Diamondback Rattlesnake



# AZ Coral Snake

- Venom - more potent than rattlesnakes
- Small, shy and quick moving snake - has small fangs and carries little venom
- **IMMEDIATELY** notify Staff or Site Commander



# Knowledge Review

- How can you prevent blood-born pathogen exposure?
- Name the most common venomous snake in AZ?
- Name 3 venomous insects in AZ?
- What are 3 ways to prevent bee stings?
- What is the best way to prevent all bites & stings?



# Thermal Hazards

- Heat Stress – failure of body core cooling
- Illnesses can result from uncontrolled exposure to heat stress include:
  - **heat rash**
  - **heat collapse**
  - **heat cramps**
  - **heat exhaustion**
  - **heat stroke**



# Heat Stress can kill ....

## Recognize the signs

- General feeling of weariness and impaired performance of motor, mental or vigilance jobs
- Swelling of arms, hands, legs and feet
- Heat rash – “Prickling” sensation
- Red or pale cool skin, heavy sweating, extreme thirst
- Weakness and exhaustion
- Body cramps
- Headache or nausea
- Dizziness, light-headed or fainting

# Heat Illness Outcomes

- Timing and effectiveness of first aid – determines the medical outcome
- OSHA standards require availability of:
  - Medical personnel for advice and consultation
  - Person(s) trained to render first aid and CPR
  - Adequate first aid supplies
  - Potable drinking water



# Preventing Heat Related Illness

- Water, Rest, and Shade
- Properly hydrate – prior to activity
- Replenish electrolytes
- Acclimatization – get body used to heat conditions
- Wear proper loose clothing
- Wear cooling towels provided
- Rest properly prior to event
- Avoid alcoholic, high-sugar-content and caffeinated beverages
- Manage personal medications



# Managing Hydration



- Hydrate before starting work
- Continuous fluid intake - during course of physical activities
- Recommendation - drink one cup of water every 15-20 minutes in hot environments
- Do not rely on thirst as an indicator
- Avoid “heat hangover” (headaches and fatigue)  
-continue fluid intake after exposure to hot environments and strenuous activity

# Managing Personal Medications

- Some medicines increase heat illness risks
  - Allergy medicines (antihistamines) and decongestants
  - Weight loss diet pills and illegal drugs (e.g. amphetamines)
  - Some medicines that treat mental health conditions (antidepressants and antipsychotics)
  - Seizure medicines (anticonvulsants)
  - Laxatives
  - Water pills (diuretics)
  - Some blood pressure and heart medicines



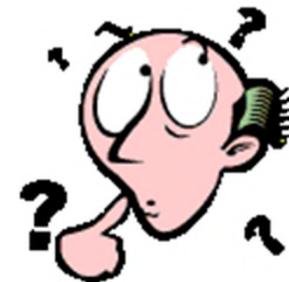
# Volunteer's Responsibility



- Learn the symptoms of heat stress
- Practice proper heat illness prevention
- Identify and **DO NOT** treat a heat stress condition
- Immediately **NOTIFY** Staff or Site Commander - if you experience or observe the signs of heat stress

# Knowledge Review

- What are 3 personal reasons for increased risk to develop heat related illness?
- What are 3 causes of heat illness?
- What are 3 ways to prepare for work in hot environments?
- How do you properly manage hydration?
- How do you properly manage personal medications?
- What are your responsibilities as a volunteer?



# EMERGENCY PROCEDURES



# Emergency Procedures



- Volunteers (and staff) - must report minor or suspected, accident, injury, illness, and/or property damage to the Site Commander
- Detailed in HHW Program Site Safety & Health Plan (SSHP) - maintained at every collection facility and remote event
- SSHP available for review at collection events



# Handling Emergencies

- Reference the SSHP
  - Site-specific instructions and procedures, phone numbers and directions
  - Site-specific trained staff (emergency response)
- Sound the alarm (**notify Staff**)
  - Fire
  - Chemical spill
  - Medical emergency
- Site Commander - coordinates response and is ultimately responsible for safety

# Incidental Chemical Release

- Non-emergency release
  - substance can be absorbed, neutralized, or controlled by staff
  - limited in quantity, exposure potential, or toxicity
  - presents minor safety, health or environmental hazards





# Incidental Release Action

- Volunteer responsibilities:
  - Recognizing or suspecting the presence of hazardous materials or an emergency release
  - Identifying the hazardous substance (if possible)
  - Protecting themselves
  - Calling for appropriate assistance
  - Securing the area (if directed and trained)

# Emergency Response Release

- Poses significant safety, health and environmental dangers
- Potential for escalation in a short time
- Cannot be absorbed, neutralized or controlled by staff





# Emergency Response Action

- At each site, know:
  - Who you are to notify if you find a spill?
  - How you will be notified of need to evacuate?
  - Where you are to evacuate to?
  - When you will be allowed to leave and/or return?

# Emergency Response Action

- When dealing with an unknown substance  
**ASSUME THE WORST**
- Avoid contact with chemical releases
- Keep unauthorized individuals away
- Follow all instructions given by staff or emergency responders



# Wrap up

- Final Tips to Remember:
  - Ask questions if unsure – “there are no dumb questions”
  - Get help immediately - if spills or unknown wastes are encountered inside or outside of vehicles
  - Notify staff immediately - if you do not feel good or are hurt in any way



# Knowledge Review

- Describe the 3 emergency response levels?
- What is an incidental release?
- What is an emergency response release?
- What should you do if there is an emergency response release?
- When may you leave the evacuation area?



# Knowledge assessment



- **INSTRUCTIONS**

- Make sure you write your name on the form
- You may use your written materials to answer the questions
- Bring “impossible” questions up to the instructor
- Please remain quiet once you are finished
- Do not leave – answers will be reviewed together

Thank You for Volunteering!

