

**OSHA- NDLO**  
**TRAIN-THE-TRAINER: THE SILENT HAZARDS**

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Activity 1: Introduction to the Silent Hazards (30 minutes)

During this activity we will introduce the participants to what we are calling “the silent” hazards. We will explore some of the reasons why workers do not seem to pay close attention or even disregard weather as a hazard and also why it is important for each worker, no matter what type of work they do, to protect him or herself according to the type of temperature they may be exposed to at work. Another very important topic we will discuss in this workshop is the importance of understanding the type of product we use at the workplace and how these products may be slowly and silently be harming us.

There are hazards that are easy to identify, those that pose an obvious threat to the safety of those that perform that type of job. For example, when using a ladder, most people are aware that being in high places can lead to falls, or that there’s always the potential for cuts when using a power saw. However, there are hazards that are not as easy to identify and more often than not, workers ignore or disregard their existence.

Many day laborers have to work outdoors, which means weather conditions are going to interfere with having a safe working environment. Certain weather conditions pose a serious risk to their health and safety. That is why it is important to pay close attention to how they can protect themselves from weather and environmental hazards at the jobs.

Other hazards that workers are often exposed to are chemicals. Because chemicals are used in nearly all work activities, they represent certain chemical risks in a large number of workplaces. Many different chemicals are used everyday, and unfortunately, many day laborers are not knowledgeable of how dangerous they can be. For that reason, it is important to create a useful approach to safety in the use of chemicals.

This training will focus on identifying environmental and chemical hazards, symptoms, first aid and methods of prevention. We will also review ways to work safely with chemicals and alternatives.

## Activity 2: Weather Hazards (1.5 hrs.)

Through the use of information cards, we will review some of the most common health risks that workers are exposed to in different weather conditions. Each card will contain information about an illness caused by weather conditions, the symptoms associated with it and a list of first aid measures. On the back of the card, there will be illustrations of such illness.

Note that the cards do not have any preventative information. Each participant will have the opportunity to participate in the creation of a plan to prevent becoming victims of any of the following illnesses: heat stroke, heat exhaustion, heat syncope, heat cramps, heat rash, UV radiation, hypothermia, cold water immersion, frostbite, trench foot, and chilblains.

Explain to the participants that day laborers can be exposed to a lot of different weather hazards, depending on where they are working, the season, the time of day and the duration of time they're working outdoors and how prepared they are for that environment. During the summer months, workers are at risk to the health effects of extreme heat, such as heat stroke, heat rash and heat exhaustion, as well as ultraviolet (UV) radiation. On the other hand, during the winter months, workers are at risk to the effects of extreme cold, including hypothermia and frostbite. Ask participants: What is the most extreme weather condition that you have been exposed to at work?

Say to the participants that it is important to talk to the workers about weather and environmental hazards; how to identify certain hazards and how to protect themselves from dangerous situations due to the weather.

During this training we hope to cover the following:

- Educate your workers about weather and environmental hazards and the illnesses and injuries that could result if the proper safety measures are not taken to prevent/reduce exposure.
- Ensure trainers are able to recognize the signs and symptoms of weather and environmental-related injuries and illnesses.
- Train day laborers on the right use of PPE according to the type of hazard present and make sure you have instructed your workers to wear PPE.
- How to schedule work while bearing in mind the time of day, duration of work, and other variables that would increase/decrease the severity of weather and environmental hazards.

## **HEAT STRESS**

### **Overview**

Workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat rashes. Heat can also increase the risk of injuries in workers.

Ask the participants: Why do you think heat can increase the risk of injuries at the workplace? Possible answers may include: heat it may result in sweaty palms, fogged-up safety glasses, and dizziness. Burns may also occur as a result of accidental contact with hot surfaces or steam.

Who is affected by heat? Workers at risk of heat stress include outdoor workers and workers in hot environments. Workers at greater risk of heat stress include those who are 65 years of age or older, are overweight, have heart disease or high blood pressure, or take medications that may be affected by extreme heat.

Prevention of heat stress in workers is important. We will review what heat stress is, how it affects workers health and safety, and how it can be prevented.

### **Types of Heat Stress**

Hand out the cards to the participants and ask them to help you read them out loud. Each card will contain a description of the illness, symptoms and first aid measures. The cards you will review with the participants are “heat stroke,” “heat exhaustion,” “heat cramps” and others.

**After you have reviewed the cards with the participants, tell them:** It’s important for workers to understand the risks associated with heat stress to ensure they will be aware and active participants of its risks prevention, but that is not enough. Whenever possible, we need to do our part in educating employers about those risks, but even more so, of how to protect workers.

### **Here are some recommendations for employers:**

- Schedule maintenance and repair jobs in hot areas for cooler months.
- Schedule hot jobs for the cooler part of the day.
- Acclimatize workers by exposing them for progressively longer periods to hot work environments.
- Reduce the physical demands of workers.
- Use relief workers or assign extra workers for physically demanding jobs.
- Provide cool water or liquids to workers.
  - Avoid drinks with caffeine, alcohol, or large amounts of sugar.
- Provide rest periods with water breaks.
- Provide cool, shaded areas for use during break periods.
- Monitor workers who are at risk of heat stress.
- Provide heat stress training that includes information about:
  - Worker risk
  - Prevention
  - Symptoms
  - The importance of monitoring yourself and coworkers for symptoms
  - Treatment
  - Personal protective equipment

**Workers should avoid exposure to extreme heat, sun exposure, and high humidity when possible. When these exposures cannot be avoided, workers should take the following steps to prevent heat stress:**

- Wear light-colored, loose-fitting, breathable clothing such as cotton.
  - Avoid non-breathing synthetic clothing.
- Gradually build up to heavy work.
- Schedule heavy work during the coolest parts of day.
- Take more breaks in extreme heat and humidity.
  - Take breaks in the shade or a cool area when possible.
- Drink water frequently even if you are not thirsty. Drink enough water that you never become thirsty.
- Avoid drinks with caffeine, alcohol, and large amounts of sugar.
- Be aware that protective clothing or personal protective equipment may increase the risk of heat stress.
- Monitor your physical condition and that of your coworkers.

## **UV RADIATION**

### **Overview**

Ask participants if they have ever been exposed to the sun and been affected by that in a serious way?

Explain to participants that Ultraviolet (UV) rays are a form of radiation from the sunlight that is invisible. UV rays can penetrate and change the structure of skin cells, which can lead to skin cancer. There are three types of UV rays: ultraviolet A (UVA), ultraviolet B (UVB), and ultraviolet C (UVC). UVA is the most abundant source of solar radiation at the earth's surface and penetrates beyond the top layer of human skin. Scientists believe that UVA radiation can cause damage to connective tissue and increase a person's risk for developing skin cancer. UVB rays penetrate less deeply into skin, but can still cause some forms of skin cancer. Natural UVC rays do not pose a risk to workers because they are absorbed by the Earth's atmosphere.

Sunlight exposure is highest during the summer and between 10:00 a.m. and 4:00 p.m. Working outdoors during these times increases the chances of getting sunburned. Snow and light-colored sand reflect UV light and increase the risk of sunburn. At work sites with these conditions, UV rays may reach workers' exposed skin from both above and below. Workers are at risk of UV radiation even on cloudy days.

### **Risks of UV Radiation**

Review “sunburns” card with the participants.

## **Skin Cancer**

Because day laborers are often exposed to long periods of sun exposure, it is important for them to be able to identify different skin cancer types. Oftentimes, workers are unaware to the negative effects that UV radiation can have on their bodies and in result, they disregard the symptoms and signs of skin abnormalities. Here is some information that can be useful:

Review the 3 skin cancer cards with the participants.

### ***Symptoms***

In particular, watch for:

- Irregular borders on moles (ragged, notched, or blurred edges).
- Moles that are not symmetrical (one half doesn't match the other).
- Colors that are not uniform throughout.
- Moles that are bigger than a pencil eraser.
- Sores that bleed and do not heal.
- Itchy or painful moles.
- Red patches or lumps.
- New moles.

### **Workers should follow these recommendations to protect themselves from UV damage:**

- Wear sunscreen with a minimum of SPF 15.
  - SPF refers to the amount of time that persons will be protected from a burn. An SPF of 15 will allow a person to stay out in the sun 15 times longer than they normally would be able to stay without burning. The SPF rating applies to skin reddening and protection against UVB exposure.
  - Sunscreen performance is affected by wind, humidity, perspiration, and proper application.
- Old sunscreens should be thrown away because they lose their potency after 1-2 years.
- Sunscreens should be liberally applied at least 20 minutes before sun exposure.
  - Special attention should be given to covering the ears, scalp, lips, neck, tops of feet, and backs of hands.
- Sunscreens should be reapplied at least every 2 hours and each time a person gets out of the water or perspires heavily.
  - Some sunscreens may also lose efficacy when applied with insect repellents, necessitating more frequent application when the two products are used together.
- Another effective way to prevent sunburn is by wearing appropriate clothing. Light layers of clothing work best, in light colors, which reflect heat, rather than dark ones, which absorb it. Natural fibers like cotton are coolest.

- Workers should also wear wide-brimmed hats and sunglasses with almost 100% UV protection and with side panels to prevent excessive sun exposure to the eyes.

## **COLD STRESS**

### **Overview**

Say to the participants: Workers who are exposed to extreme cold or work in cold environments may be at risk of cold stress. Extreme cold weather can be very dangerous and lead to health emergencies in outdoor workers, and those who work in an area that is poorly insulated or without heat. What is considered cold weather can vary across different areas of the country. For workers that are not used to winter weather, freezing temperatures are considered factors for "cold stress." Whenever temperatures drop decidedly below normal and as wind speed increases, heat can leave your body more rapidly. These weather-related conditions may lead to serious health problems.

### **Types of Cold Stress**

Review the cold stress cards with the participants. The cards include: "hypothermia," "cold water immersion."

### **Recommendations for Workers**

- Alert the supervisor and request medical assistance.
- Cold water robs the body's heat 32 times faster than cold air. If you should fall into the water, all efforts should be given to getting out of the water by the fastest means possible.
- Physical exercise such as swimming causes the body to lose heat at a much faster rate than remaining still in the water. Blood is pumped to the extremities and quickly cooled. Remain as calm as possible and avoid swimming.
- Should you find yourself in the water, avoid panic. Air trapped in clothing can provide buoyancy as long as you remain still in the water. Swimming or treading water will greatly increase heat loss and can shorten survival time by more than 50%.
- The major body heat loss areas are the head, neck, armpits, chest and groin. If you are not alone, huddle together or in a group facing each other to maintain body heat.

Then review the following cards: "frostbite," "trench foot" and "chilblains."

### **Recommendations for Employers**

Employers should take the following steps to protect workers from cold stress:

- Schedule maintenance and repair jobs in cold areas for warmer months.
- Schedule cold jobs for the warmer part of the day.
- Reduce the physical demands of workers.

- Use relief workers or assign extra workers for long, demanding jobs.
- Provide warm liquids to workers.
- Provide warm areas for use during break periods.
- Monitor workers who are at risk of cold stress.
- Provide cold stress training that includes information about:
  - Worker risk
  - Prevention
  - Symptoms
  - The importance of monitoring yourself and coworkers for symptoms
  - Treatment
  - Personal protective equipment

### **Recommendations for Workers**

Workers should avoid exposure to extremely cold temperatures when possible. When cold environments or temperatures cannot be avoided, workers should follow these recommendations to protect themselves from cold stress:

- Wear appropriate clothing.
  - Wear several layers of loose clothing. Layering provides better insulation.
  - Tight clothing reduces blood circulation. Warm blood needs to be circulated to the extremities.
  - When choosing clothing, be aware that some clothing may restrict movement resulting in a hazardous situation.
- Make sure to protect the ears, face, hands and feet in extremely cold weather.
  - Boots should be waterproof and insulated.
  - Wear a hat; it will keep your whole body warmer. (Hats reduce the amount of body heat that escapes from your head.)
- Move into warm locations during work breaks; limit the amount of time outside on extremely cold days.
- Carry cold weather gear, such as extra socks, gloves, hats, jacket, blankets, a change of clothes and a thermos of hot liquid.
- Include a thermometer and chemical hot packs in your first aid kit.
- Avoid touching cold metal surfaces with bare skin.
- Monitor your physical condition and that of your coworkers.

### Activity 3: The Weather Wheel (1 hour)

After listening to all of the different illnesses and risks that workers can encounter when working under difficult weather conditions, participants will be part of a game called the “the weather wheel.” Using the information they have received, they will be asked several questions about the illness, symptoms and first aid measures; but in addition to that, they will have to come up with a prevention plan in order to get the points necessary to advance in the game. The wheel has different sections that represent either hot or cold illnesses.

### **Rules of the game:**

Divide the participants into three to four groups. Each group will represent a type of work day laborer perform, for example construction workers, cleaning crew, painters, gardeners, etc.

To figure out what group will go first, have them pick a piece of paper from a hat. Each piece of paper will have a number from 1 to 4. Whoever gets number 1 will go first and so on.

Each group will have a chance to spin the wheel, and depending on where it stops (heat or cold stress), that group will have to answer a question related to that weather condition. The facilitator will ask questions from the cards that were reviewed earlier. The group must answer the question in order to get the points from the slot they got.

The two groups that earn the most points at the end of 30 minutes get to go on for the next part of the game. In this section, each group will have to create a prevention plan for a weather condition that will be given to them. They will have 10 minutes to come up with a plan to protect workers. At the end of the 10 minutes, each group will have 5 minutes to present their plan and explain to the judges how their prevention plan will protect workers.

The rest of the participants (the other groups that got the least points) will serve as the judges for the prevention plan. **They will judge the prevention plans based on the "hierarchy of control" from TTT#2.**

The group that presents the best prevention plan wins. (We may have a prize available for the winner).

#### Activity 4: Understanding the Hazards Associated With the Use of Chemicals (30 minutes)

Explain to the participants: Nowadays, the use of chemicals has spread to almost all branches of work activities; therefore, there are risks in many work places. There are thousands of chemical substances that are used in large and small quantities, there are many new ones introduced each year and most people do not know how to read their labels or handle them with the necessary precautions. However, it is your right to know and it is important to be well informed of the correct and safe use of chemicals at the workplace.

The first and most essential step leading to safe use of chemicals is to know their identity, hazards to health and the environment and the means to control them. This knowledge should be available with reasonable effort and cost. Furthermore, information on the hazards and corresponding protective measures should be identified and conveyed to the user in a form that is easy to understand.

Ask participants to raise their hands if they use or have used chemicals at work. Of those participants that raised their hands, ask them to name the chemical products they use. Of those that were able to name the chemical products they use, ask them whether they use PPE when handling the chemical or not and the reason why.

(This exercise will allow the facilitator to see what levels of knowledge participants have about the chemicals they use at work and at home and if they understand the risks associated with handling those substances).

Workers must have the information of the chemicals they are going to use, as well as the hazards they pose and safety measures.

Notes for the facilitator:

The objectives of the following activities are:

- Inform participants about the risks associated with the use of chemicals.
- Provide information on how to read chemical labels to use chemical safely.
- Train day laborers on the right use of PPE according to the type of hazard present.

### **What are Chemical Products?**

Ask participants to help you read each section. Give examples after each section is read.

**Hazardous chemical products** are those that can harm people or the environment. Ask participants if any of them have been injured or gotten sick by a chemical they used. There are several factors that influence how dangerous and harmful a chemical can be:

- The level of toxicity
- If it can enter your body
- How long you are exposed to it
- The health of the person exposed to the chemical
- The reactivity of the chemical

**How useful are chemical products?** Every day we are exposed to countless chemical products that have become essential in our life but unfortunately we are not informed about their effects and consequences.

**Risks of the chemical products:** Even nowadays, the possible effect that many products can produce on people's health and on the environment is not exactly known.

**Types of chemicals found at the workplace:** The physical form of a chemical can influence the way in which it enters the organism, and to some extent, the harm it causes. The main physical forms of chemicals are solids, dusts, liquids, vapors and gases.

### ***Solids***

- Solids are the least likely of the chemical forms to cause chemical poisoning. However, certain chemical solids can cause poisoning if they get onto your skin or food and you then ingest them.
- Personal hygiene is important to prevent the ingestion of chemical solids.
- The greatest danger with solids is that some work processes can change them into a more dangerous form.

### ***Liquids***

- Many hazardous substances, for example acids and solvents are liquid in room temperature.
- Many liquid chemicals detach vapors that can be inhaled.
- The skin can absorb liquid chemicals. Some liquid chemicals can damage the skin immediately. Other liquids go on directly through the skin to the bloodstream, from which they can transfer to different parts of the organism and have harmful effects.
- It is necessary to apply control measures for liquid chemicals to eliminate or to diminish the possibility of inhalation, exposure to the skin and damage to the eyes.

### ***Vapors***

- The steams are droplets of liquid suspended in the air.
- A lot of chemical liquid substances evaporate at room temperature, which means that they form a vapor and remain in the air.
- Vapors from some chemicals can irritate the eyes and the skin.
- The inhalation of certain chemical toxic vapors can have different serious health consequences.
- Vapors can be inflammable or explosive. To avoid fires or explosions, it is important to keep the chemical substances that evaporate far from heat sources.
- There should be control measures to avoid exposure of workers to the vapors that emit from liquids, solids or any other state of chemicals.

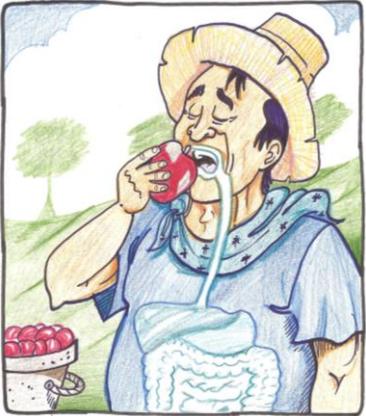
### ***Gases***

- Some chemicals are in the form of gas at room temperature. Other chemicals, in liquid or solid form, turn into gases when they warm up.
- It is easy to detect some gases for based on their color or smell, but there are other gases that cannot be seen nor smelled, and they can only be detected through the use of special equipment.
- Gases can be inhaled.
- Some gases produce irritating effects immediately. The effects that other gases have in the health of people can only be identified once the health of the individual has been seriously compromised.

- Gases can be inflammable or explosive. It is necessary to be cautious when working in a place where there are explosive and inflammable gases.
- Workers should be protected at the workplace from the possible hazardous effects of chemical gases through efficient control measures.

Activity 5: Routes of entry to the organism of chemical pollutants (30 minutes)

Show participants the drawing of the route of entry. In the back you will be able to read information about the drawing that you can explain to the participants. Then ask participants how they can protect themselves from chemicals based on the routes of entry. Possible answers will be provided in a “prevention” table.

<p><b>RESPIRATORY ROUTE</b> through the nose and the mouth, the lungs, etc.</p>		<p>This is one of the most important routes of entry or penetration because it is through the air that many toxic substances such as dust, smokes, aerosols and gases can enter our bodies.</p>
<p><b>DIGESTIVE ROUTE</b> through the mouth, stomach, intestines, etc.</p>		<p>Route of entry through the mouth, the esophagus, the stomach and the intestines. Pollutant ingestions dissolved in mucus in the respiratory system should also be considered.</p>

<p><b>PARENTERAL ROUTE through open wounds, sores, etc.</b></p>		<p>Route of entry of the pollutant to the body through open wounds, sores, etc.</p>
<p><b>DERMAL ROUTE through the skin</b></p>		<p>Route of entry of many substances that are able to go through the skin without causing erosion or noticeable alterations and that can enter the blood to later be spread to the whole body.</p>

**Prevention Table:**

Review the table with the participants.

<p><b>WAY OF ENTRY/RISK</b></p>	<p><b>PREVENTION METHOD</b></p>
<p><b>RESPIRATORY ROUTE: INHALATION OF THE PRODUCT</b> Irritation of the airway and intoxication in the case of exposure to very strong products.</p>	<ol style="list-style-type: none"> <li>1. Handle products in well-ventilated areas.</li> <li>2. Avoid for products to become pulverized.</li> <li>3. Use PPE (the proper equipment according to the product manufacturer).</li> </ol>
<p><b>SPLASHING THAT CAN AFFECT THE EYES AND THE FACE</b> The eyes and the face can be severely damaged, especially by corrosive products.</p>	<ol style="list-style-type: none"> <li>1. Handle the products with care, avoiding splashing (not shaking the container or any brushes, sticks or rags that may have been used).</li> <li>2. Don't rub your eyes after handling the chemical product.</li> <li>3. Use the proper PPE (goggles, face masks, etc.)</li> </ol>
<p><b>PRODUCT PENETRATION THROUGH THE SKIN</b></p>	<ol style="list-style-type: none"> <li>1. Always wash your hands after using a chemical product.</li> </ol>

Irritation, burns and allergies can develop from exposure to the chemical product.	2. If you have an open wound, cover that area thoroughly. 3. Use PPE that protects the skin (coveralls, gloves, etc.)
INGESTION The consumption of chemical products can be very serious for the health.	1. Keep the products locked or in a place where only authorized personnel has access. 2. Always keep the containers closed.

Activity 6: Types of effects caused by chemical substances (30 minutes)

Divide the participants in 3-4 groups. Each will be given a table, which will have 5 columns. Each column will correspond to the toxic property, the affected area, the time of appearance, the effects and examples. Each group will have 10 minutes to match phrases to the corresponding column as well as the toxic property. Some of the phrases will already be filled in others will be left blank. Each group will present their tables to the rest of the participants. Discussion will follow.

<b>Toxic Property</b>	<b>Affected Area</b>	<b>Time of Appearance</b>	<b>Effects</b>	<b>Example</b>
Irritant or corrosive	The eyes, the lungs and the skin	From a few minutes to several days	Inflammation burns and blisters on the exposed area. Chronic exposure may cause permanent damage.	Ammonia, sulfuric acid, nitrogen oxide, sodium hydroxide.
Allergic	The lungs and the skin	From days to years	It can cause chronic illnesses in the lungs that are similar to asthma or permanent disability.	Toluene diisocyanate (TDI), amine hardeners for epoxy resins.
Dermal	According to the skin	From days to years	Rash with inflammation and scaling of the skin. It can come from a chronic exposure to irritant products.	Highly ionized acids, alkali, and detergents.
Carcinogenic	Any organ,	From 10 to	Cancer in the	2-Naphthylamine,

	the skin, the lungs and the bladder	40 years	organs or affected tissue. In the long term, it can cause premature death.	some tars and oils.
Asphyxiating	The lungs	Minutes	Gases replace the normal content of oxygen of the air.	Acetylene, carbon dioxide.

Activity 7: Controlling Chemical Hazards (30 minutes)

**Chemical Labeling – How to read them!**

Tell participants: Health and safety information on chemical substances is public, so you have the right to ask for the facts!

OSHA’s Hazard Communication standard requires chemical manufacturers or importers to classify the hazards of chemicals, which they produce or import. Also, it requires all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, safety data sheets, and information and training.

Explain to the participants that OSHA defines a hazardous chemical as anything that is a physical or health hazard.

Physical hazards are pretty straightforward. They include flammable and combustible liquids, compressed gasses, explosives, organic peroxides, oxidizers, pyrophorics, and water reactive.

Health hazards are a little harder to determine, however OSHA indicates they include the following: carcinogens; reproductive toxins; sensitizers; irritants; corrosives; neurotoxins; hepatotoxins; nephrotoxins; agents that act the hematopoietic system; and agents that damage the lungs, skin, eyes or mucus membranes.

We have stated before that most of us are exposed to chemicals in one way or another, but how many of us can read a label and understand it? Have any of you read the labels of the chemicals we use?

Ask participants to name some of the things they have noticed on a chemical label: The list may include: the name of the chemical, a drawing, the active ingredients, a warning, who makes it, etc. Write them on a sheet of butcher paper.

According to OSHA, labels on purchased chemicals must include:

1. The common name of the chemical
2. The name, address and emergency phone number of the company responsible for the product
3. An appropriate hazard warning

The warning may be a single word - "danger", "warning" and "caution" - or may identify the primary hazard, both physical (i.e., water reactive, flammable or explosive) and health (i.e., carcinogen, corrosive, or irritant). Most labels will provide you with additional safety information to help you protect yourself while working with substances. This includes protective measures to be used when handling the material, clothing that should be worn, first aid instructions, storage information and procedures to follow in the event of a fire, leak or spill.

Read the label each time you use a newly purchased chemical. It is possible the manufacturer may have added new hazard information or reformulated the product since your last purchase, and thus altered the potential hazards you face while working with the product.

### **SAMPLES OF LABELS**



**CORRECT**



**INCORRECT**

### Activity 8: Symbols of Chemical Products (1 hour)

In this activity, participants will watch a video depicting a cartoon character 'Napo' involved in some work activities that put him in danger when using chemicals. The video can be found at <http://www.napofilm.net/en/napos-films/napoepisode?filmid=napo-012-danger-chemicals>.

After watching the video, participants will be asked to pick one card from a pile. Each card corresponds to a symbol found in chemical product and what it represents. They will then have to look for the person that has the image or title that corresponds to each other. For example the person with the "X" symbol will look for

the person the sign "Harmful (Xn) /Irritant (Xi)." Once the participants with the matching cards have found each other, they will have to talk to each other about the symbol they have and what is its potential for danger. They will come open with an example of what chemical product they have seen this symbol on or if they have experienced an accident produced by that particular hazard. This activity will help review what they saw on the video, as well as a discussion.

	<p><b>Highly Flammable</b></p>	<p>This symbol with the words "highly flammable " denotes a substance which:</p> <ul style="list-style-type: none"> <li>• may become hot and finally catch fire in contact with air at ambient temperature;</li> <li>• is a solid and may readily catch fire after brief contact with the source of ignition and which continues to burn or to be consumed after removal of the source of ignition;</li> <li>• is a gas and burns in air at normal pressure;</li> <li>• in contact with water or damp air releases highly flammable gases in dangerous quantities;</li> <li>• is a liquid that would catch fire with slight warning and exposure to a flame.</li> </ul>
	<p><b>Oxidizing</b></p>	<p>This symbol with the word "oxidizing " denotes a substance, which releases a lot of heat while it reacts with other substances, particularly flammable substances.</p>
	<p><b>Toxic (T)</b></p>	<p>This symbol with the word " toxic " denotes a highly hazardous substance. The decision to use the word " toxic " is based on LD 50 values (substance that kills up to 50 per cent of a sample of laboratory test animals within a specified period). Therefore, extreme caution is necessary in the use of these agrochemicals and instructions on the label must be strictly followed.</p>

	<b>Very Toxic (T+)</b>	This symbol with the words "very toxic" is used to label a substance which, if it is inhaled or ingested or if it penetrates the skin, may involve extremely serious, acute (immediate) or chronic (longer-term) health risks and even death.
	<b>Harmful (Xn) /Irritant (Xi)</b>	(Xn) This symbol with the word "harmful" should appear on the label of a substance which, if it is inhaled or ingested or if it penetrates the skin, may involve limited health risks. (Xi) The same symbol as for "harmful" but with the word "irritant" is meant for a non-corrosive substance which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation.
	<b>Corrosive</b>	This symbol with the word corrosive" will be found on the label of a substance which may destroy living tissues on contact with them. Severe burns on the skin and flesh might result from splashes of such substances on the body.
	<b>Dangerous for the Environment</b>	Dangerous and harmful for the environment.
	<b>Explosive</b>	This symbol with the word "explosive" denotes a substance which may explode under the effect of a flame or if subjected to shocks or friction.

Activity 9: How to Read a NFPA Chemical Hazard Label (1 hour)

In this activity we will teach participants how to read the NFPA Chemical Hazard Label. We will go over what each color and symbol represents. We will follow by giving them samples of labels found in products that are commonly used in different jobs day laborers perform; for example glass cleaner, thinner, crack sealant, paint, wood stain, etc. Participants will have to fill out a blank NFPA Chemical Hazard label with information about a chemical we will provide.

You may have noticed a diamond shaped label with 4 different colors and numbers in some chemical products. The label may look simple, but it actually carries a lot of information and it may help you identify the hazards associated with that product. This label is color-coded and each color represents a different type of hazard. Also, as mentioned before, it also uses a number system and each number represents the degree of a particular hazard.

 <b>NFPA Rating Explanation Guide</b> 					
RATING NUMBER	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD	RATING SYMBOL	SPECIAL HAZARD
<b>4</b>	Can be lethal	Will vaporize and readily burn at normal temperatures	May explode at normal temperatures and pressures	ALK	Alkaline
<b>3</b>	Can cause serious or permanent injury	Can be ignited under almost all ambient temperatures	May explode at high temperature or shock	ACID	Acidic
<b>2</b>	Can cause temporary incapacitation or residual injury	Must be heated or high ambient temperature to burn	Violent chemical change at high temperatures or pressures	COR	Corrosive
<b>1</b>	Can cause significant irritation	Must be preheated before ignition can occur	Normally stable. High temperatures make unstable	OX	Oxidizing
<b>0</b>	No hazard	Will not burn	Stable	☸	Radioactive
				W	Reacts violently or explosively with water
				W OX	Reacts violently or explosively with water and oxidizing

**Special Notice Key (White)**- This table contains special indications for some products. For example, if it is an oxidizing product, corrosive, water reactive or radioactive.

Example:



Note: Regardless of the numbers on the label - even if they carry ones or zeros - be cautious. All chemicals should be treated with the utmost of care.

#### Activity 10: PELs- Permissible Exposure Limits (30 minutes)

Tell participants that as we have learned, it is important to understand the types of products we use in order to assess the type of protection we need and also the routes of entry and how our health can be affected. But equally important, is understanding how long we can be exposed to a chemical.

Health and safety authorities establish the exposure limits of hazardous substances. OSHA PELs are based on an 8-hour time weighted average (TWA) exposure. An employer can be cited and fined if employees are exposed over the PEL.

Exposure limits usually represent the maximum amount (concentration) of a chemical, which can be present in the air without presenting a health hazard. However, exposure limits may not always be completely protective, for the following reasons:

Information for chronic health effects is not complete because it may take many years for an illness to appear.

Workers can be affected by chemical exposure at different levels depending on their own physical state and how much strength is needed to perform their job. Chemical interactions are not taken into account. How many different chemical products are being used?

Limiting the chemical concentration in air may not prevent excessive exposure through skin contact or ingestion.

### Activity 11: How can I protect myself? (30 minutes)

Let participants know that it is very important for them to be well informed of the chemical products they have to use at work and to know what to do in case they are overexposed to chemical hazards. Since day laborers often do not have the proper training, it is important for them to be aware of a few things they can do that can potentially protect them and their co-workers:

**The Right to Know-** everyone who works with toxic substances should know the names, toxicity, and other hazards of the substances they use. Employers are required by law to provide this information, along with training in how to use toxic substances safely.

**PELs-** the surest way to prevent toxic chemicals from causing harm is to minimize or prevent exposure. Limiting exposure at the source is the preferred way to protect workers.

**Substitution-** use a less hazardous substance. But before choosing a substitute, thoroughly consider its physical and health hazards. Also consider environmental aspects such as air pollution and waste disposal.

**Ventilation-** make sure there is circulation of fresh air sufficient to keep concentrations of toxic substances diluted below hazardous levels.

**Work practices and behaviors-** workers can control dust dispersion by spraying water (or dust suppressant products), closing containers of volatile chemicals when not in use, and labeling containers of hazardous substances.

**Use of PPE-** workers should wear Personal Protective Equipment when handling chemicals:

Respiratory protective equipment consists of devices that cover the mouth and nose to prevent substances in the air from being inhaled. A respirator is effective only when used as part of a comprehensive program established by the employer, which includes measurement of concentrations of hazardous substances, selection of the proper respirator, training the worker in its proper use, fitting of the respirator to the worker, maintenance, and replacement of parts when necessary. A health care professional must first determine whether the individual worker can wear a respirator safely.

Protective clothing includes gloves, aprons, goggles, boots, face shields, and any other materials worn as protection. It should be made of material designed to resist penetration by the particular chemical being used. Such material may be called

impervious to that chemical. However, most materials do not remain impervious for very long. The manufacturer of the protective clothing usually can provide some information regarding the substances that are effectively blocked and how often replacement is necessary.

**What if I have been exposed?**

If you or your co-workers experience symptoms known to be caused by a chemical during or shortly after its use, you may have been overexposed. Symptoms might include irritation and tearing of the eyes, a burning sensation of skin, nose, or throat, and cough, dizziness, or headache.

**Here are some things you can do in case of overexposure to chemical hazards:  
Stop what you are doing and leave the space contaminated. Alert your  
supervisor. Call 911 for emergencies or the Poison Control Center  
1-800-222-1222.**

**In case inhalation:** clean air, rest in a semi recumbent position, artificial respiration if needed and medical care.

**In case of a stroke:** take off contaminated clothing, wash area with plenty of water, seek medical care.

**In case of splashing:** Rinse with plenty of water for several minutes and seek medical care.

**In case of consumption:** rinse the mouth, DO NOT induce vomiting, drink plenty of water, and seek medical care.

*Some content of this training was adapted from the publication "An Introduction to Chemical Hazards in the Workplace" by the State of California Department of Public Health and Department of Industrial Relations.*