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Overview

Hazardous chemicals can result in a variety of injuries or catastrophic events if not handled properly. Workers who may have contact with these chemicals must understand the hazards associated with them. Through proper training and access to information concerning hazardous chemicals, employees gain vital knowledge that helps keep them and their co-workers safe while on the job.
Training Materials

Collect all of the necessary materials and supplies before training begins. Here are some suggested materials and supplies:

- A training location that is free of distractions, has good lighting, and a comfortable temperature.

- Desks and chairs arranged so that everyone will be able to see the viewing screen, the facilitator, and each other.

- The video, a VCR, and a TV with a remote. Make sure the video is rewound.

- An employee handbook and pen/pencil for each trainee. Each handbook includes a quiz at the back, which can be used to test comprehension and document training.

- Other supplies and equipment you may need - blackboard chalk, paper, handouts, transparencies, overhead projector, markers, notepads, etc.

- Additional information, such as a copy of the regulation or other reference tools.
Preparation

A successful presentation requires preparation and planning. Give yourself several days before the training session to get organized.

- Locate and schedule the training site as soon as possible.
- Notify trainees of the training date and time, the training schedule, and proper dress.
- Obtain all necessary equipment and supplies.
- Make sure you know how to operate the TV, VCR, and other equipment. Check to ensure that it is working properly. Replace or repair any damaged equipment.
- Prepare your presentation, including a lesson plan or outline of the training. Include the training goals and objectives. Some presentation guidelines are included on the next page. A sample lesson plan has been included on page “f” of this Facilitator’s Guide.
- A day or so before conducting the training session, you may want to have participants take the quiz as a pre-test. The results of this test can help you to determine weak areas to focus on during the training session.
- Preview the videotape. Note any key points you want to expand upon in your training.
Presentation Guidelines

How you present the training course can have a great impact on learning. By following these simple presentation guidelines and keeping your objectives in mind, you can effectively and efficiently get the most out of your training session.

Organize Training Time Efficiently
In today’s busy work climate it can be difficult to find the time needed for training, so it is important to be organized and well-prepared when you do schedule training sessions. Whether you use Summit’s suggested lesson plan or not, it is important to have a lesson plan prepared that you can implement comfortably. This ensures that time spent in training is productive and beneficial for everyone.

Stress the Purpose and Goals of Training
Training needs to be goal-oriented. State the purpose of training in a clear, specific manner - whether it’s to reduce injuries, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so trainees know what is expected of them.

Capture Their Attention
Training needs to be interesting and compelling to hold trainees’ attention. To help motivate learners, give them specific evidence that their effort makes a difference and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.
Make New Learning Experiences Pleasant
For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.

Ask If There are any Questions
When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.
Lesson Plan

As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested lesson plan for your use.

1. Program Objective
This guide reviews *Hazard Communication: Informed for Safety*. In it, we will cover:
- Hazardous Chemicals
- Material Safety Data Sheets
- Container Labels
- Safety Checklist

2. Show the Video: “*Hazard Communication: Informed for Safety*”

3. Discussion and Demonstration
To help relate the training to your site, you may wish to incorporate your own discussion topics and exercises. Key issues you might consider include:

- What procedures must be followed in the event of a hazardous chemical spill at the facility?
- How does someone request a copy of an MSDS in a foreign language?
- What should an employee do if they believe a chemical is labeled incorrectly?
4. Use Handbooks to Reinforce Training
The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee information retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator’s Guide is provided to document employee training. Answers to the quiz are provided on a separate page.

5. Questions and Answers
Provide for a Q&A session to answer any questions. It may be necessary to review some of the material when providing answers. The employee handbook, equipment manuals, and other reference tools may be helpful.

Other relevent Summit titles that might be of interest:
Ammonia Safety
Compressed Gas Cylinders
Container Labeling: What You Don’t Know Can Hurt You
Hazardous Materials Handling Series
Hazardous Materials Security
Hazard Recognition: Out Of The Ordinary
Hexavalent Chromium
Hydrogen Sulfide Safety
PPE: Create The Barrier
Preventing Spills
Respiratory Safety Series
Frequently Asked Questions

If a container is found with no label or the label is torn and unreadable, what should I do? Handling, storing, or mixing chemicals incorrectly can be extremely dangerous. This is why a container found without a label or with an unreadable label must be reported immediately to a supervisor. Never attempt to use or identify the material yourself without checking with your supervisor.

What kind of safety measures should I take to protect myself from injury when working with a hazardous chemical? Make sure you know where a chemical’s MSDS is located. Read and understand the information contained within the MSDS for each hazardous chemical you handle. Follow safe handling instructions specific to that particular chemical. In addition, only use chemicals that are properly identified with labels. Read the labels and determine which type of PPE is needed, as well as other safe handling requirements. Be sure to report a missing label immediately. Follow all safety policies and procedures, especially those involved with emergency situations. Always ask questions if you need anything clarified.
Introduction

Just your average, uneventful commute to work. The sort millions of people make every day.

One of the things that keeps our commute uneventful is the steady stream of information and guidance supplied all along the route. We so take this information for granted that we rarely give a thought to how important it is to our safety. But imagine for a moment if that information wasn’t there... the exit signs... the cautions and warnings... even the traffic lights. All gone. Suddenly our morning commute would be very eventful. And the results... all too predictable.

Workplaces committed to safety also supply a steady stream of information and guidance to employees.
Hazard Communication... HazCom... the “Right-to-Know” standard. In the workplace they all mean the same thing: When working around hazardous chemicals, it’s essential that workers understand the risks and know how to protect themselves. According to the Occupational Safety and Health Administration, or OSHA, over 30 million Americans are exposed to hazardous chemicals in the workplace. To help protect these workers, OSHA’s Hazard Communication Standard covers some 650,000 hazardous chemical products found in over three million establishments.
In this program we will discuss:

- How hazardous chemicals can injure the body if proper precautions aren’t taken.
- Material Safety Data Sheets, a source for detailed information about the chemicals you work with...
- Container labels, a critical tool for identifying the chemicals that are onsite.
- Finally, we’ll run through a Safety Checklist – a review of best work practices when working with chemicals.

Why is it important to know about the properties of the chemicals you work with? Because every hazardous chemical is hazardous in specific ways, and the measures you need to take to stay safe vary from chemical to chemical. What are some of the potential dangers?
Physical Hazards
Physical hazards come from chemicals that can cause violent bodily harm or physical injury. Common physical hazards include:
- Fire
- Explosion
- Reactivity (Which is the tendency of some chemicals to react with other chemicals, leading to the generation of extreme heat or other dangerous conditions.)

For obvious reasons, physical hazards can be extremely dangerous, and anyone handling one of these chemicals must make sure they know what they’re doing to avoid injuring themselves and others.
Health Hazards
Health hazards are the second type of danger associated with chemicals. These are the illnesses and diseases caused by external and/or internal contact with hazardous chemicals. OSHA places chemical health hazards into several categories that include:

Carcinogen – Carcinogens are chemicals capable of causing cancer.

Corrosive – When a corrosive comes in contact with living tissue, its chemical action causes visible destruction or irreversible alterations to the area it contacts.

Toxic – A toxic chemical is a chemical that is lethal at certain concentrations. Even when concentrations aren’t at lethal levels, these chemicals can cause acute or chronic injury to the human body. Depending on a chemical’s degree of toxicity, OSHA classifies it as “toxic” or “highly toxic.”
**Irritant** – Chemicals classified as irritants have an effect on living tissue but not in a corrosive way. Where irritants come in contact with tissue they cause a reversible inflammation.

**Sensitizer** – A sensitizer is a chemical that causes a substantial percentage of the people exposed to it to develop an allergic reaction.

**Target Organ Effects** – “Target organ effects” is a broad category. These chemicals target specific organs in the body. For example, silica and asbestos do most of their damage to the lungs. Other chemicals may target the liver, kidneys, skin, eyes, blood, nervous system, or reproductive system.
As this list makes clear, unless you know what you’re doing, working around hazardous chemicals can put you and your coworkers in danger. Whether a chemical puts you at risk for physical hazards, health hazards, or both, not knowing how to protect yourself can be fatal. Fortunately, you can protect yourself, and for every one of the chemicals classified as hazardous at your worksite, the information you need to stay safe is available to you.

As part of your employer’s ongoing commitment to safety, they’ve conducted a chemical inventory – this is a list of every chemical that’s used or stored at your facility. They’ve also assessed the risks in your work environment and created a written program that details your facility’s compliance with the Hazard Communication Standard. This document, which assigns responsibilities and describes work procedures specific to your facility, is available to you upon request.
Another important source of information for employees comes from training. Employees receive training on the relevant chemical hazards whenever they begin a new job, or when hazardous chemicals are newly introduced to the worksite. What type of training? Every employee must know which chemicals are used in their area, how to work safely with those chemicals, how to tell if they’ve been overexposed, and what to do if an emergency occurs.

While the written program and employee training help create a safe-running facility, during day to day operations there are two other sources of information that are absolutely critical: material safety data sheets and container labels. Every employee who works around hazardous chemicals must understand both, and consult them routinely while on the job.
In a program like this of course there’s no way to detail the dangers of every one of the half-million-plus chemicals used in the American workplace. And if we could... who could remember it all?

What we can do, instead, is show you where to find information about the specific chemicals used at your worksite. Information you must have to stay safe while on the job.

At your workplace, every hazardous material or chemical requires a material safety data sheet, or MSDS. Prepared by the chemical manufacturer or supplier, an MSDS is a chemical’s “fact sheet.” While container labels are an important source of information, MSDSs go into much greater detail about a chemical’s hazards and how to protect yourself. For this reason, you should consult the MSDS for any hazardous chemical you work with.
OSHA allows the format or look of MSDSs to vary, but certain information must appear on every MSDS. This information includes:

**Product name** — To avoid confusion, the chemical and common names used on the MSDS must allow for cross-referencing with the name that appears on the product label.

**Hazardous ingredients** — Often a chemical product isn’t a single chemical but a mixture; in these cases, the individual hazardous ingredients will be listed along with their properties.

**Physical and chemical characteristics** — This includes such properties as a chemical’s vapor pressure, evaporation rate, flash point, and solubility with water.

**Routes of entry** — In other words, the ways a chemical can enter the body to cause harm.
**Permissible exposure limit** – The maximum level of exposure to a chemical that is considered acceptable and safe.

The two types of hazards:  
**Physical hazards** – As already discussed, materials that are flammable, explosive or reactive. And...

**Health hazards** – chemicals that react with the body to create illness, such as carcinogens. Along with whether the health affects are acute or chronic, symptoms of over-exposure such as dizziness and shortness of breath will also be listed.

**Control measures** – Which are methods for avoiding exposure. These include engineering controls and the personal protective equipment needed to prevent direct contact with hazardous chemicals.

**Safe handling and use** – A description of the safety precautions required during routine handling and use of a chemical. Information on proper cleanup of spills and storage of chemicals is also listed.
Emergency and first aid procedures – If a chemical release and/or exposure occurs, what to do to minimize the damage and bring the situation under control.

Date of preparation – When the MSDS was created or revised. Information sometimes changes, and this date makes it easier to confirm that you have the most up-to-date version of the MSDS.

Contact information – The name, address and phone number of the chemical manufacturer, supplier or other party responsible for the MSDS. If necessary, they can be contacted for additional information on the hazardous chemical and on appropriate emergency procedures.

While an MSDS may be translated into other languages to assist non-English speaking employees, the original MSDS must be in English. You’ll usually find these documents kept in a binder that’s located for easy access.
Container Labels

When it comes to information about hazardous chemicals, container labels provide a sort of “first-line-of-defense.”

At the source of potential contact with a chemical, a container label clearly identifies what that chemical is and provides basic, but important information about how to handle that chemical safely. While they’re not as informative as an MSDS, it’s critical that an appropriate identifying label is affixed to any container that holds hazardous chemicals. To protect your health, before working with any chemicals, read all container labels and follow the directions.
Containers that hold chemicals are divided into two types – primary and secondary. Both have labeling requirements. Primary containers are the original containers the chemical was shipped or stored in. At a minimum, the label on a primary container must have: the name of the chemical, the physical and health hazards associated with the chemical, and the name and address of the manufacturer, importer or other responsible party. Other information may include PPE requirements, directions for safe use, first aid information, and safe storage and disposal recommendations. Any directions that the manufacturer places on a label should be followed. Secondary containers are usually smaller, more manageable containers that the chemical is transferred to for easier handling. The label on a secondary container must have the name of the chemical and
the hazard statement – when transferring a chemical from a primary container to a secondary container this label information should also be transferred verbatim. The one exception to this labeling requirement for secondary containers is if the transferred chemical will be used immediately by the employee who performed the transfer – although even here appropriate labeling usually makes good safety sense. Labels on all containers – primary and secondary – must be legible, in English, and prominently displayed on the container. If you find a container with a missing or unreadable label report this to your supervisor immediately.
There is no standard, universal format for labels. There are, however, several formats that are widely used. Two formats that you’re likely to run into again and again are the Hazardous Materials Information System (or HMIS), and the National Fire Protection Association label (or NFPA). The familiar HMIS label was developed specifically to help companies comply with OSHA’s Hazard Communication Standard. The label uses colored bars, numbers and symbols to communicate a chemical’s hazards. At the top of the label is a white area where the name of the chemical goes. Below this, there are three colored bars: blue (for Health Hazard), red (for Flammability), and either yellow (for Reactivity),
or, on some newer labels, orange (for Physical Hazard). Each of these bars has a white box – a number in this box indicates the severity of the hazard: the numbers run from zero, meaning no danger, to four, which represents the highest risk. The blue bar may have an extra box: if this box has an asterisk in it, this indicates a chronic health hazard, meaning that exposure over a long period of time could cause long-term, slower-to-develop health problems such as emphysema or liver damage. At the bottom of the label is another white section. In this area letters of the alphabet indicate the appropriate PPE to use with this chemical. Each letter indicates specific requirements, but, in general, the farther into the alphabet you go, the more PPE you need to don.
The other very common hazard label that we’ll look at is the NFPA “hazard diamond.” This label was developed to warn first responders of the hazards present during an emergency. To meet the requirements of the Hazard Communication Standard additional information must appear on the label. The basic label is a diamond divided into four sections. The blue, red, and yellow fields are used to denote health hazard, flammability and reactivity, respectively. Like the HMIS label, a numbering system from 0 to 4 indicates severity of the hazard, but the criteria for each of these rating systems...
is somewhat different. The biggest difference between the two labels, however, is the white field at the bottom. On the NFPA label, this section is reserved for special hazards: letter abbreviations or symbols indicate such hazards as radioactivity, corrosiveness, a highly toxic material, an oxidizer, an acid and unusual reactivity with water.
Safety Checklist

Does the task you’re about to perform require PPE to guard against chemical exposure?

What are the potential hazards of the chemicals in your work area, and, if you or a coworker is exposed, what treatments should be started immediately to minimize physical harm? You don’t want to guess at the answers to questions like these. When working around hazardous chemicals you need to know what you’re doing. Having a checklist of best work practices can help keep you on track during the routine of everyday job tasks.
While your own checklist may vary depending on the type of work you do and the chemicals you work with, here are safety measures that anyone who handles hazardous chemicals must be aware of:

- Know where your facility’s MSDSs are kept.
- Comply with the each chemical’s MSDS information.
- Use only properly labeled containers.
- Read a container’s entire label.
- Report every chemical spill, leak and accident.
- Know the location of all eyewash and emergency shower stations in your area.
- Use appropriate PPE when needed.
- Understand what to do in case of an emergency.
- Follow all safety policies at your facility.
- If information is unclear or you have questions, ask your supervisor.
A healthy work environment begins with access to good information. Fortunately, your facility’s commitment to the Hazard Communication Standard helps ensure that the information you need is readily at hand. Use this information whenever you work around hazardous chemicals to stay informed and stay safe.
Quiz

To review your knowledge of *Hazard Communication: Informed for Safety*, answer the questions below.

Your name ________________________________ Date ________________________________

1. What type of hazards include fire, explosion, or reactivity when dealing with hazardous chemicals?
   a. Physical hazards
   b. Health hazards
   c. All of the above
   d. None of the above

2. What category of health hazard causes people to develop an allergic reaction when exposed to the chemical?
   a. Toxic
   b. Carcinogen
   c. Irritant
   d. Sensitizer

3. Employees must receive training every time a new hazardous chemical is introduced to the worksite.
   a. True
   b. False

4. Besides your facility’s written safety program and employee training, what are two other key sources of information that employees use to learn about the hazardous chemicals in their work area?
   a. Driver logs
   b. Material Safety Data Sheets
   c. Container labels
   d. PTO forms
5. Every hazardous chemical at your worksite has a material safety data sheet providing specific information pertaining to that chemical.
   a. True       b. False

6. According to OSHA, every MSDS must look the same.
   a. True       b. False

7. A chemical transferred from its primary container to a secondary container never needs a label.
   a. True       b. False

8. If a container is found with an unreadable label you should report it to your supervisor as soon as possible.
   a. True       b. False

9. On an HMIS label, what does an asterisk in the blue health section mean?
   a. PPE required
   b. No known hazard
   c. A chronic health hazard
   d. Permit required

10. What does the white section on the NFPA label represent?
    a. Special hazards
    b. Chronic health hazards
    c. PPE needed
    d. Flammability
Quiz Answers

1. a Physical hazards
2. d Sensitizer
3. a True
4. b Material safety data sheets
c Container labels
5. a True
6. b False
7. b False
8. a True
9. c A chronic health hazard
10. a Special hazards
This wallet size perforated card will be included in every Hazard Communication: Informed for Safety Employee Handbook.

### Front of Card

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<td><strong>HAZARD INDEX</strong></td>
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<td>4 Severe Hazard</td>
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<td>3 Serious Hazard</td>
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<td>2 Moderate Hazard</td>
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<td>1 Slight Hazard</td>
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<td>0 Minimal Hazard</td>
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If an (*) asterisk appears to the left of the health hazard rating, it means chronic health hazard.

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<td>Alkali</td>
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<td>Reacts violently with water</td>
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