PERSONAL PROTECTIVE EQUIPMENT

DANGER
HARD HATS
AND
SAFETY BOOTS
MUST BE WORN
ON THIS SITE
PERSONAL PROTECTIVE EQUIPMENT

Learning Objectives

By the end of this lesson, students will be able to:

- List types of Personal Protective Equipment (PPE) that can be used to protect the hands, face, head, eyes, and feet. Describe the hazards each type of PPE protects against.
- Explain why workers may not want to use PPE.
- Explain what should be included in PPE training, including key criteria to ensure the equipment will be protective: fit, size, appropriate material.
- Describe/demonstrate the proper way to don gloves, eye protection and/or a hard hat.

Time Needed: 40 Minutes

Materials Needed

- Handouts: What is Personal Protective Equipment? (A)
  Use the Right Respirator (B)
  Hand Protection (Gloves) (C)
  Hearing Protection (D)
- A bag or box of PPE (as many as possible: hard hat, face mask, goggles, dust masks, and respirators with filter cartridges, several types of gloves, hearing protection, Tyvek suit.)

Preparing to Teach This Lesson

Before you present this lesson:

1. Make copies of the four different handouts for students.
2. Pull together your collection of PPE. You may want to contact a local safety supply vendor; they are often willing to donate some basic PPE.

Detailed Instructor’s Notes

A. Introduction: Why this subject is important (5 minutes)

1. Discuss why this topic is important.
   - PPE can protect workers only if it is properly selected, worn, and maintained. That’s why training is important.
   - Each year over 100,000 people have temporary or permanent vision loss because of eye injuries.
   - PPE is not just a workplace issue. It’s important in personal life for sports, hobbies, and recreational activities.
B. Handout and Discussion (10 minutes)

1. Distribute the Handouts (A), *What is Personal Protective Equipment?*, (B) *Use the Right Respirator*, (C) *Hand Protection (Gloves)*, and (D) *Hearing Protection*. After giving students a few minutes to review them, hold a class discussion using the following questions:

*What are some examples of PPE?*

*What are some common jobs where teens are employed?*

*Give some examples of PPE they might need to do their job.*

Personal protective equipment, or PPE, is designed to protect you from hazards found on or off the job. Face shields used in ice hockey and helmets used for biking are examples of PPE; other examples include goggles, safety glasses, foot protection, coveralls, gloves, vests, earplugs, and respirators.

*Why is a PPE considered the least effective type of protection against injury?*

- It may not fully protect you
- It may be uncomfortable to wear.
- It requires the employee to have it, put it on, and keep it on.
- It might not fit correctly.

It is important to remember that PPE comes in various sizes. If the PPE does not fit correctly, it may be necessary to find and try a different size or brand. In order for it to be effective and provide protection, PPE must fit properly.

PPE is often used in combination with other hazard-control methods like removing the hazard from the workplace and using good work rules.

Even though PPE is considered to be the least effective form of protection, there are some conditions where it is the only protection available to protect the worker. For example, if a worker has to do work in a confined space, they may have to wear a respirator because ventilation may not be adequate.

*If PPE is needed, what training is required for its use?*

- How to use PPE the right way
- When PPE is needed
- What kind of PPE to use
- What PPE can and cannot do to protect workers
- How to put it on, adjust, wear, and take off PPE
- How to take care of PPE

Discuss additional key points from Handout (B) *Use the Right Respirator*, (C) *Hand Protection (Gloves)*, and (D) *Hearing Protection*, during the PPE Grab Bag activity.
C. PPE Grab Bag (15 minutes)

(or select an alternative activity described in E)

1. Put a variety of PPE into a bag or box. Explain that you will be handing out PPE and each person/ group should address the following questions about their item and add information as needed. Write these questions on the board.

   How does this protect you?

   What training would you need to use this item?

   What kind of jobs might require wearing such an item?

   Why might you not want to wear this while working?

2. Have each student (or a small group of students) pull an item from the bag.

3. Go around the room to as many students or groups as you can and ask them to answer the questions about their item for the class. If appropriate, ask the student to demonstrate use of the equipment.

   • **Hard hats** can protect workers’ heads from being hit by objects or coming in contact with electricity. Different types of hard hats protect against different hazards. Look for the marking ANSI Z89.1.

   • **Safety shoes, leggings, and foot guards** help protect workers from falling objects, sharp objects, wet and slippery surfaces, hot surfaces, and electrical hazards.

   • **Face shields, goggles, and safety glasses** with side shields can protect workers from liquids and solids that can get into their eyes. Look for the marking ANSI Z87.1.

   • **Earplugs or earmuffs** can help prevent damage to hearing. Exposure to high noise levels can cause irreversible hearing loss as well as physical and psychological stress.

   • **Gloves** can protect workers’ hands from chemicals, hot and cold temperatures, vibration and sharp objects. Gloves must fit properly and be the right kind of material for the job.

   **Instructors Note:** It is important to be aware that different types of glove materials will protect against different types of chemicals. For example a nitrile glove will provide better protection against solvents than a latex glove will. (A glove material permeation chart can be viewed at: [http://www.ansellpro.com/download/Ansell_7thEditionChemicalResistanceGuide.pdf](http://www.ansellpro.com/download/Ansell_7thEditionChemicalResistanceGuide.pdf)

   • **Respirators.** Employers must first try to remove breathing hazards. If they can’t, workers may have to wear respirators. The kind of respirator required depends on the kind of hazard the worker is exposed to. For example, dust masks do not protect against chemical vapors. (See Handout (B) Use the Right Respirator.) Respirators must also fit correctly in order to prevent illness. If a worker has to wear a respirator, it is the employers responsibility to provide the employee with a medical evaluation to make sure they are healthy enough to work safely in a respirator.

   • **Full body suits.** In some cases workers must protect most or all of their bodies against heat, cold, radiation, hot metals and liquids, body fluids, or hazardous materials.
D. Additional Resources

OSHA’s webpage on personal protective equipment:

E. Alternative Activities

The following short descriptions of activities are provided as an alternative to the PPE Grab Bag Activity.

**PPE Grab Bag for Specific Trade:** Same concept as the PPE Grab Bag, but you focus on the trade you are teaching and have PPE commonly used for the trade (e.g. construction, welding, etc.).

**PPE Zones:** Display or hand out a drawing of a body divided into five zones (head, torso, legs, hands, and feet). Have students think about what job hazards, for specific occupations, might be relevant for each body zone and what PPE might be appropriate for protecting that zone. You could draw bodies for different occupations and divide the class into small groups to do the activity, concluding with each group sharing their picture with the class.

**PPE Shopping:** Place PPE samples on a table and give each student or group of students a job (construction, restaurant worker, etc.). Ask students to consider the hazards they may face, then have them shop for the PPE on the table. You may have prices associated with each piece of PPE; ask students to track how much they might have to spend for PPE.

**Incorporate PPE** with skills, tools, and jobs you are already teaching. Take the opportunity to elaborate on the proper use of PPE as you teach your other skill sets.

The following OSHA and State of Washington L&I-DOSH-WISHA codes correspond to information in this unit:

OSHA 29 CFR 1910.134
L & I DOSH WISHA WAC 296-800-160 Personal Protective Equipment (PPE)
WHAT IS PERSONAL PROTECTIVE EQUIPMENT?

Personal protective equipment, or PPE, is designed to protect you from hazards found on or off the job. Face shields used in ice hockey and helmets used for biking are PPE; other examples include goggles, safety glasses, foot protection, coveralls, gloves, vests, earplugs, and respirators. If you must wear PPE for your job, your employer must train you to use it properly. Some PPE must comply with national standards, called ANSI standards. For example on safety glasses look for the ANSI marking “Z 87” on the temples of the glasses.

When do you need PPE?

Employers must assess their workplaces to find out if there are hazards that require workers to use PPE. If there are such hazards, employers must select the right type of PPE and make sure it fits the employee correctly. In most cases, the employer is required to supply PPE to their workers at no charge, however there may be exceptions if you wear your PPE off the job site. Employers must train workers who have to use PPE on how to use it correctly. This includes the following:

- Knowing when PPE is needed
- How to use PPE correctly
- Knowing what kind of PPE to use
- Understanding what PPE can and cannot do to protect workers
- How to put on, adjust, wear, and take off PPE
- How to maintain PPE.

Limitations

PPE is the least effective way to protect you from hazards. That's because it may not fully protect you and may be uncomfortable to wear. However, you still have to wear it if your job requires it. PPE is often used in combination with other ways to control hazards, like removing the hazard or using good work rules. Even though PPE is the least effective form of protection, there are some conditions where it is the only protection that may be available to the worker.

Can PPE protect workers from head injuries?

Yes. Hard hats can protect workers' heads from being hit by objects or coming in contact with electricity. Different types of hard hats protect against different hazards. Look for the marking ANSI Z89.1.

How can PPE protect workers from foot and leg injuries?

Safety shoes, leggings, and foot guards help protect workers from falling objects, sharp objects, wet and slippery surfaces, hot surfaces, and electrical hazards.
**Does PPE help protect workers from eye and face injuries?**
Yes. Face shields, goggles, and safety glasses with side shields can protect workers from liquids and solids that can get into their eyes. Look for the marking ANSI Z87.1.

**What can PPE do to protect workers from hearing loss?**
Wearing earplugs or earmuffs can help prevent damage to hearing. Exposure to high noise levels can cause irreversible hearing loss as well as physical and psychological stress.

**Should workers wear PPE to help prevent hand injuries?**
Yes. Gloves can protect workers’ hands from chemicals, hot and cold temperatures, vibration and sharp objects. Gloves must fit properly and be the right kind for the job.

**Why should workers wear PPE to protect the whole body?**
In some cases workers must protect most or all of their bodies against heat, cold, radiation, hot metals and liquids, body fluids, or hazardous materials.

**When should workers wear PPE for respiratory protection?**
Employers must first try to remove breathing hazards. If they can’t, workers may have to wear respirators. The kind of respirator you need depends on what kind of hazard you are exposed to. For example, dust masks do not protect you from chemical vapors. Respirators must fit correctly in order to help prevent illness. All workers required to wear respirators must first have a medical evaluation paid for by the employer.

**REMEMBER: PPE is the last line of defense against workplace hazards.**
Even though PPE is considered to be the least effective form of protection, there are some conditions where it is the only protection that may be available to the worker.
If you do have to wear a respirator, it is important to note that a medical evaluation is required.

If those MDS5s aren’t there, you should have paid more attention to those lungs. They don’t belong to you. They don’t belong to me. They belong to the people who are going to be using this mask. We just assumed that was enough protection. My father used a respirator. He never shop. He never was a respirator. We never shop. We never were a respirator. We never shop. We never were a respirator. We never shop.

Respiratory protection will need to use a respirator to protect yourself using a better chemical, better ventilation of other controls. You should not be breathing some other kinds of protection. But if these is no way to wear one and it doesn’t have one. They also want to be able to wear one and it doesn’t have one. They also want to be able to wear one and it doesn’t have one.

Respirators can be lost. If you are not lost, you can’t find it. You will be working with a respirator. For protection against the hazard, you can check on the label of the respirator or the box it came in.

Respirators

1. WHEN SHOULD YOU USE A RESPIRATOR?

The right protection.

2. WHICH KIND OF RESPIRATOR SHOULD YOU USE?

No one respirator is right for all kinds of hazards.

- How much do you are exposed to.
- What hazard are you exposed to.

The type of respirator you need depends on:

Dust Masks

Never try on single step respirator, unless is approved by NIOSH/MSHA. A good nose grip and strap. This is a double strap.

If you use a dust mask, make sure it has a nose grip.

Second-hand smoke, can cause cancer. Against cigarette vapors or protection against asphalt, silica, or lead, dust masks is less effective. Dust masks provides a good fit for smoke or odor control. Dust masks protect against:

OSHA 11 Personal Protective Equipment

Use the Right
OSHA 11
Personal Protective Equipment

Respirators
Air-Supplied

There are not enough oxygen to
work in confined space where
air is lacking. Use them when you
face a lack of oxygen.

Breathing hazards.

Any set of information
respirators are available for
combination

The mask with this label... respirators.

Chemical cartridges.

Vapors or gases.

Chemical filters.
Different chemical hazard.

Respirators.

Dual cartridge.

Know about respirators.

What else do you need to

Fit testing.

To get a proper fit with most respirators.

Cautions if you have a beard. It is impossible

Refit a respirator, if no clear reseal.

Fit the face mask over the eyes. Secure it, put your hands over the eye region.

Fit the respirator on your face. If you can smell the air or

The respirator must be kept clean, and the cartridges or filters

Propriety.

Make sure your respirator is maintained.
Hand Protection (Gloves)

Don’t take your hands for granted. Can you imagine trying to work without your hands?

Hand injuries include cuts, burns, fractures, amputations, nerve damage and skin rashes. Skin irritation, rashes, and even poisoning can occur from handling chemicals with bare hands.

Gloves can protect hands from:
- Knives, sharp edges, splinters
- Chemicals
- Blood and bodily fluids
- Excessive vibration
- Hot objects
- Electricity
- Extreme cold

There are many types of protective gloves:
- Leather gloves protect your hands from rough surfaces
- Special insulated gloves can protect your hands from hot objects
- Cut-resistant gloves prevent or reduce cuts from knives or sharp edges
- Anti-vibration gloves reduce the effects of vibration from hand tools and machinery
- Disposable gloves protect against blood and germs
- Electrically insulated gloves are used to handle live wires or energized electrical equipment

Different glove materials will protect against different types of chemicals; make sure you have the right kind of glove for the chemical you are using.

(To view a sample glove permeation chart, go to http://www.ansellpro.com/download/Ansell_7thEditionChemicalResistanceGuide.pdf)

Gloves do have limitations:
- Gloves can get caught on rotating machinery
- Latex gloves can cause severe allergic reactions in people allergic to latex.
- Gloves can cause problems if chemicals get inside the gloves
- Gloves can fail in conditions of extreme temperatures, high mechanical force, high vibration or extremely harsh chemicals
- If you have the wrong kind of glove, it may not protect you. For example, certain kinds of chemical solvents can go right through standard rubber or latex gloves.
Glove use and care:
- Use the correct size and fit of glove to give you the needed dexterity
- Clean your hands before using gloves
- Clean fabric and leather gloves regularly or discard them
- Do not use latex gloves if you are sensitive to latex or have a latex allergy
- Replace gloves if they have cuts, tears, holes or defects
- Make sure gloves are right for the job—don’t use leather or fabric gloves to handle liquid chemicals.
Hearing Protection

Exposure to loud noise will inevitably cause hearing loss over time. Protect your hearing! A good rule of thumb: if you have to shout to be heard, the noise level is damaging your hearing.

There are two types of hearing protection: earplugs and ear muffs. All hearing protectors are designed to reduce the intensity (loudness) of noise for the inner ear.

**Earplugs**

Earplugs are made of foam, rubber, or plastic. They can be one size fits all or small, medium, or large. Many earplugs are disposable, but some are reusable. They are lightweight and require no maintenance. They are inserted into the ear canal. At first, some people may find earplugs uncomfortable to wear for long periods of time, but most people can find a comfortable fit by trying different sizes or brands. There are even custom-molded earplugs. **Ear Muffs**

Ear muffs cover the whole ear. They have replaceable pads and some types can filter out specific noise pitches. Ear muffs last longer than most earplugs, but they can be uncomfortable in hot weather and may not fit well over glasses or people with heavy sideburns.

**Noise reduction rating:**

The “noise reduction rating” or “NRR” of hearing protection is measured in decibels. The NRR is found on the ear muff or earplug package. The higher the number, the greater the protection

**Proper Use of Hearing Protection:**

- Hearing protection only works when used properly.
- You cannot remove hearing protection for just a minute in a noisy area.
- It takes just a few minutes of unprotected exposure at noise above 115 decibels to risk hearing damage.
- Earplugs not inserted properly into the ear canal will not provide complete protection.
- Ear muffs not snug against the head will leak noise into the ear.
- Portable music devices do not provide protection against noise—they only add to it.

This material was adapted from Washington State Department of Labor and Industries training tools: Noise Exposure at Work