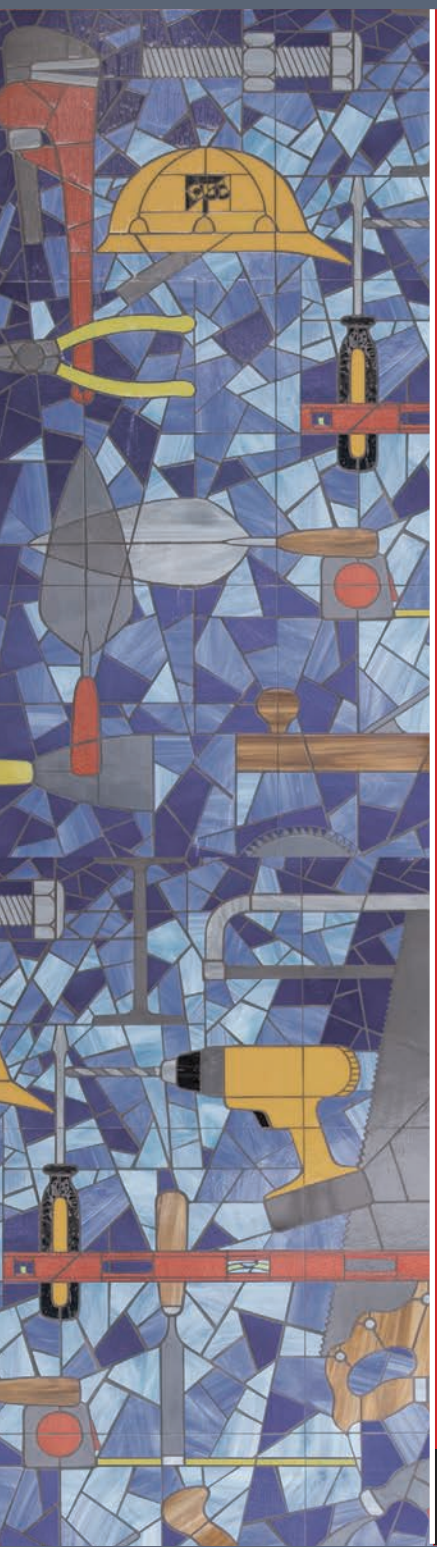
00101-15
Basic Safety (Construction Site Safety Orientation)





Core Curriculum
Lesson Plans for Instructors

Module One

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Lesson Plans for Module 00101-15

Basic Safety (Construction Site Safety Orientation)

Module One (00101-15) explains the importance of safety in the construction and industrial crafts. Trainees will learn how to identify and follow safe work practices and procedures and how to properly inspect and use safety equipment. Trainees will be able to describe the safety practices associated with elevated work; energy release; and various hazards encountered on job sites. **NOTE:** The successful completion of this module will award a Construction Site Safety Orientation credential.

Objectives

Learning Objective 1

- Describe the importance of safety, the causes of workplace incidents, and the process of hazard recognition and control.
  a. Define incidents and the significant costs associated with them.
  b. Identify the common causes of incidents and their related consequences.
  c. Describe the processes related to hazard recognition and control, including the Hazard Communication (HAZCOM) Standard and the provisions of a Safety Data Sheet (SDS).

Learning Objective 2

- Describe the safe work requirements for elevated work, including fall protection guidelines.
  a. Identify and describe various fall hazards.
  b. Identify and describe equipment and methods used in fall prevention and fall arrest.
  c. Identify and describe the safe use of ladders and stairs.
  d. Identify and describe the safe use of scaffolds.

Learning Objective 3

- Identify and explain how to avoid struck-by and caught-in-between hazards.
  a. Identify and explain how to avoid struck-by and caught-in-between hazards.
  b. Identify and explain how to avoid caught-in and caught-between hazards.

Learning Objective 4

- Identify common energy-related hazards and explain how to avoid them.
  a. Describe basic job-site electrical safety guidelines.
  b. Explain the importance of lockout/tagout and describe basic procedures.

Learning Objective 5

- Identify and describe the proper use of personal protective equipment (PPE).
  a. Identify and describe the basic use of PPE used to protect workers from bodily injury.
  b. Identify potential respiratory hazards and the basic respirators used to protect workers against those hazards.

Learning Objective 6

- Identify and describe other specific job-site safety hazards.
  a. Identify various exposure hazards commonly found on job sites.
  b. Identify hazards associated with environmental extremes.
  c. Identify hazards associated with hot work.
  d. Identify fire hazards and describe basic firefighting procedures.
  e. Identify confined spaces and describe the related safety considerations.

Performance Tasks

Performance Task 1 (Learning Objective 2)

- Properly set up and climb/descend an extension ladder, demonstrating proper three-point contact.

Performance Task 2 (Learning Objective 5)

- Inspect the following PPE items and determine if they are safe to use:
  – Eye protection
  – Hearing protection
  – Hard hat
  – Gloves
  – Fall arrest harnesses, lanyards, and connecting devices
  – Approved footwear

Performance Task 3 (Learning Objective 5)

- Properly don, fit, and remove the following PPE items:
  – Eye protection
  – Hearing protection
  – Hard hat
  – Gloves
  – Fall arrest harness

Performance Task 4 (Learning Objective 4)

- Inspect a typical power cord and GFCI to ensure their serviceability.

Teaching Time: 12.5 Hours

(Five 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

None

Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the written examinations and performance profile sheets from **www.nccerirc.com**. The passing score for submission into NCCER's Registry is 70% or above for the written examination; performance testing is graded pass or fail.

Safety Considerations

During this module, trainees will be required to set up, climb, and descend an extension ladder. The trainees should be carefully supervised during this activity and should be required to wear the PPE they would normally wear on a job site. Climbing/descending using three-point contact is an essential part of this activity.

Classroom Equipment and Materials

Whiteboard/chalkboard

Markers/chalk

Pencils and paper

Core Curriculum PowerPoint® Presentations

TV/DVD player

LCD projector and screen

Computer with internet access

Copies of the Module Examination and Performance Profile Sheets

Equipment and Materials for Laboratories and Performance Testing

Appropriate PPE:

- Eye protection
- Work gloves
- High-top safety shoes
- Hearing protection
- Hard hat

Double-insulated power tool

Job safety analysis (JSA) example documents

Task safety analysis (TSA) example documents

Examples of SDS or MSDS

Fall arrest harnesses in various sizes

Lanyards

Carabiners

Double-locking snap hooks

Extension ladder

Ground fault circuit interrupter (GFCI)

Damaged and undamaged extension cords

Various types of respirators

Provide both defective and serviceable examples of the following items:

- Eye protection, such as safety glasses and face shields
- Hearing protection, including ear plugs and ear muffs
- Hard hats
- Work gloves
- High-top safety shoes

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.

US Occupational Safety and Health Administration. Numerous safety videos are available on line at **www.osha.gov/video**.

Construction Safety, Jimmie W. Hinze. 2006. Upper Saddle River, NJ: Pearson Education, Inc.

DeWalt Construction Safety/OSHA Professional Reference, Paul Rosenberg; American Contractors Educational Services. 2006. DEWALT.

Basic Construction Safety and Health, Fred Fanning. 2014. CreateSpace Independent Publishing Platform.

Instructors are encouraged to locate additional audiovisual aids available on the internet, make personal videos, and take still pictures related to safety and add them to the PowerPoint® presentations throughout the program.

Session Outline for 00101-15

Basic Safety (Construction Site Safety Orientation)

The Lesson Plan for this module is divided into five 2.5-hour sessions.
This time includes 10 minutes for administrative tasks and a 10-minute break per session.

Session One

Session One introduces trainees to basic safety concepts, identifies the causes of safety incidents, and discusses how to recognize and avoid safety hazards on the job. This section also introduces the Safety Data Sheet (SDS) and discusses its importance in managing hazards related to chemicals used on the job.

1. Show the Session One PowerPoint® presentation.
2. Use the Kickoff Activity to get trainees engaged and give them an idea of what they will learn from this module.
3. Review the categories and causes of safety incidents.
4. Describe hazard recognition and reporting requirements.
5. Explain the purpose of an SDS and demonstrate how to interpret the information.

Session Two

Session Two is all about elevated work and the methods used to prevent injuries caused by falls from heights. Included are discussions of fall hazards; fall arrest equipment and methods; types of ladders and the safe use of ladders; and types of scaffolds and their safe uses.

1. Show the Session Two PowerPoint® presentation.
2. Review the types of fall hazards and the protections required for unprotected sides, wall openings, and floor openings.
3. Describe the various equipment used to prevent or arrest falls.
4. Demonstrate how to inspect a safety harness, lanyard, and connecting devices.
5. Describe the different types of ladders and their uses and limitations.
6. Explain how to properly set up and climb a ladder using three-point contact.
7. Describe the different types of scaffolds used on job sites and explain how to inspect and safely use scaffolds.
8. Trainees practice or complete a portion of the requirements for Performance Tasks 2 and 3.

Session Three

Session Three deals with the sections of the module covering struck-by/caught-in between hazards, as well as hazards related to unplanned energy release. The session includes coverage of vehicle hazards, trench safety, and electrical safety. Trainees will inspect a power cord and a GFCI to satisfy a Performance Task.

1. Show the Session Three PowerPoint® presentation.
2. Explain struck-by hazards, including flying and falling objects.
3. Describe the various caught-in/caught between hazards associated with tools, rotating equipment, and moving equipment.
4. Explain the hazards related to working in excavations and trenches and discuss methods used to protect workers in these situations.
5. Discuss the various ways in which workers can be injured by unwanted release of energy.
6. Explain the methods used to protect against electrical shock.
7. Describe the lockout-tagout devices and the rules that apply to the use of these devices for electrical and other types of hazards.
8. Demonstrate how to properly inspect a power cord and a GFCI to ensure their serviceability.
9. Trainees practice or complete the requirements for Performance Task 4.

Session Four

Session Four covers PPE and a variety of job site hazards.

1. Show the Session Four PowerPoint® presentation.
2. Show the trainees the various items of PPE used on a job site and explain the purpose of each item.
3. Demonstrate how to properly inspect and use each item of PPE and have the trainees practice these skills to satisfy the related Performance Tasks.
4. Describe the respiratory hazards encountered by workers, including dust, chemicals, toxic odors, and oxygen deficiency.
5. Explain the different types of respirators, along with the uses and limitations of each type.
6. Describe the job site hazards created by exposure to toxic materials such as lead, asbestos, and chemical splashes.
7. Explain how extreme heat or cold can create hazards, and discuss the methods for mitigating these hazards.
8. Describe hot work hazards related to welding and thermal cutting and explain how to avoid these hazards.
9. Describe the causes of fires and explain the methods used to prevent and fight fires.
10. Explain the hazards associated with confined spaces, how to recognize a confined space, and rules associated with entering and working in confined spaces.
11. Trainees practice or complete the balance of the requirements for Performance Tasks 2 and 3.

Session Five

Session Five is a review and testing session. In addition, this session is used for the practice and completion of Performance Task 1.

Have trainees complete the Module Review and Trade Terms Quiz. Alternatively, these may be assigned as homework at the end of Session Four. Go over the Module Review in class prior to the exam and answer any questions that the trainees may have.

1. Demonstrate how to properly and safely set up an extension ladder. Show trainees how to properly climb and descend the ladder by maintaining three-point contact at all times.
2. Trainees practice and complete the requirements of Performance Task 1.
3. Have trainees complete the written examination. Any outstanding performance testing must be completed during this session as well.
4. Record the testing results on the Registration of Training Modules Form, and submit the report to your Training Program Sponsor.

Materials Checklist for Module 00101-15, Basic Safety (Construction Site Safety Orientation)

Equipment and Materials					
Personal protective equipment:		Ground fault circuit interrupter (GFCI)		Provide both defective and serviceable examples of the following items:	
Eye protection					
Work gloves		Task safety analysis (TSA) example documents		Eye protection, such as safety glasses and face shields	
High-top safety shoes					
Hearing protection		Job safety analysis (JSA) example documents		Hearing protection, including ear plugs and ear muffs	
Hard hat					
Whiteboard/chalkboard		Carabiners		Hard hats	
Markers/chalk		Double-locking snap hooks		Work gloves	
Pencils and paper		Examples of SDS or MSDS		High-top safety shoes	
Core Curriculum PowerPoint® Presentation Slides		Fall arrest harnesses in various sizes			
LCD projector and screen		Extension ladder			
DVD player		Lanyards			
Computer with internet access		Various types of respirators			
Copies of the Module Examination and Performance Profile Sheets		Damaged and undamaged extension cords			
		Double-insulated power tool			

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.

Safety Considerations

The following consideration should be emphasized when introducing trainees to safety best practices.

Remind trainees that some forms of PPE are required any time they are in the shop or on the job site.

Safety Equipment

The use of specific safety equipment is not anticipated during this session.

Classroom and/or Lab Equipment

Job safety analysis (JSA) example documents
Task safety analysis (TSA) example documents
Examples of SDS or MSDS

Resources

No specific resources are required for this session.

Kickoff Activity

Schedule a safety expert, such as an OSHA inspector, as a guest speaker. Encourage the speaker to emphasize safety by describing occasions in which workers were spared injury or death because they were using prescribed safety equipment or methods. Also have them point out instances in which the opposite occurred because the worker violated established safety practices. Encourage the trainees to contribute to the discussion by describing instances in which they, or someone they know, avoided injury by following good safely practices such as wearing a seat belt.

Session Objective

When trainees have completed this session, they should be able to do the following:

1. Describe the importance of safety, the causes of workplace incidents, and the process of hazard recognition and control.
   a. Define incidents and the significant costs associated with them.
   b. Identify the common causes of incidents and their related consequences.
   c. Describe the processes related to hazard recognition and control, including the Hazard Communication (HAZCOM) Standard and the provisions of a Safety Data Sheet (SDS).

Session Performance Requirements

Trainees will not complete a Performance Task during this session.

Instructional Outline

Research has shown that varying instructional methods periodically throughout class sessions helps to engage and hold trainees' attention. The *Core Curriculum* PowerPoint® presentation that you received with this lesson plan is keyed to the sections of the Trainee Guide indicated below and has been designed for use with this lesson plan.

Classroom: Section 1.0.0

Explain that it is the employee's responsibility to follow established safety practices and wear the required PPE. Describe what a safety culture is, how a strong safety culture is achieved, and the benefits a contractor derives from a strong safety culture.

Classroom: Sections 1.1.0–1.1.2

Explain what an incident is as defined by OSHA and discuss the categories of incidents. Describe the "Fatal Four" hazard groups and use the chart provided to show how these four types of incidents dominate the construction industry. Explain the various ways in which on the job incidents impact workers, their families, and their employers.

Classroom: Sections 1.2.0–1.2.1

Identify the various causes of on-the-job incidents. Describe how poor communication can affect safety. Describe the types of signs used to communicate safety information on a job site. Explain the difference between information, caution, and danger signs.

Classroom: Sections 1.2.2–1.2.3

Describe how at-risk work habits, such as procrastination, carelessness, and horseplay, can affect job-site safety. Give examples of how such practices can result in injury or death. Discuss the effects of alcohol and drug use on the job. Compare on-the-job use of alcohol or drugs to driving a vehicle while under the influence. Point out that the use of some prescription or over-the-counter medications can cause performance impairment.

Classroom: Sections 1.2.4–1.2.5

Explain why lack of the necessary skills can result in an incident, citing the examples in the text. Ask the trainees to give examples of additional situations where lack of skill could result in injury. Emphasize the importance of being properly trained before using any power equipment or machinery. Discuss intentional acts that can create unsafe conditions, such as vandalism and terrorist activities.

Classroom: Sections 1.2.6–1.2.7

Use the bulleted list to describe the types of unsafe acts that can lead to injury. At each bullet, give an example of what can happen as a result of the unsafe act. Alternately, have the trainees give some of the examples. Point out the dangers of rationalizing risks in order to avoid having to follow established safety practices. Use elevated work without the proper fall protection as an example.

Classroom: Section 1.2.8

Use the bulleted list to describe the types of unsafe conditions that can lead to injury. At each bullet, give an example of what can happen as a result of the unsafe condition. Alternately, have the trainees give some of the examples. Emphasize that employees should have the right to refuse to perform work under unsafe conditions.

Classroom: Sections 1.2.9–1.2.10

Describe how poor housekeeping can affect safety. Give examples of poor housekeeping and review the basic rules for maintaining an organized, uncluttered workspace. Explain how deficiencies in the safety management system can affect safety performance. Discuss the qualities that are present in a good safety management system.

Classroom: Sections 1.3.0–1.3.1

Explain the terms *HAZCOM* and *Global Harmonization*. Use the bulleted list to discuss the responsibilities of employees under HAZCOM. Describe how to evaluate hazards related to equipment and energy release. Use the bulleted list to discuss the types of incidents that can result in injuries and the types of energy sources that are subject to undesired release of energy.

Classroom: Section 1.3.2

Explain the difference between a job safety analysis (JSA) and a task safety analysis (TSA). Use the figure or another JSA to explain how the JSA is developed.

Teaching Tip

Describe a hypothetical job site situation and have the trainees identify the hazards that should be considered when preparing a JSA. Write their answers on the board and add any that they missed. If time permits, use the information to prepare a TSA.

Classroom: Sections 1.3.3–1.3.4

Explain how the risk level of an activity is determined and discuss acceptable vs. unacceptable risks. Explain how risk is mitigated through the use of safety equipment and good safety practices. Explain the need to report all incidents and describe how OSHA and employers use incident reports to help improve safety management.

Classroom: Section 1.3.5

Provide the trainees with copies of a safety data sheet or refer them to the sample SDS in the text. Discuss the purpose of each section. Explain that the older MSDS form may still be in use to some extent. Briefly discuss the differences between the SDS and MSDS and provide a copy of an MSDS for the trainees to examine.

Wrap Up

Review the Trade Terms associated with Section 1.0.0 to reinforce the material that was presented. Ask trainees to identify any terms that were new to them or meant something different than they expected.

Homework

Assign the reading of Sections 2.0.0 through 2.4.3. In addition, ask trainees to complete the 1.0.0 and 2.0.0 Section Reviews.

Safety Considerations

The following consideration should be emphasized when discussing basic safety practices:

Remind trainees that some forms of PPE are required any time they are in the shop or job site environments.

Safety Equipment

No specific safety equipment is required for this session.

Classroom and/or Lab Equipment

Fall arrest harnesses in various sizes
Lanyards
Carabiners
Double-locking snap hooks

Resources

No specific resources are required for this session.

Session Objective

When trainees have completed this session, they should be able to do the following:

2. Describe the safe work requirements for elevated work, including fall protection guidelines.
   a. Identify and describe various fall hazards.
   b. Identify and describe equipment and methods used in fall prevention and fall arrest.
   c. Identify and describe the safe use of ladders and stairs.
   d. Identify and describe the safe use of scaffolds.

Session Performance Requirements

By the end of this session, trainees should have completed, or be able to complete, the following Performance Tasks under the supervision of the instructor:

Inspect the following PPE items and determine if they are safe to use:
– Fall arrest harnesses, lanyards, and connecting devices

Properly don, fit, and remove the following PPE items:
– Fall arrest harness

Instructors are reminded that trainee performance during practice and laboratory sessions can be used for verification of Performance Task completion.

Instructional Outline

Research has shown that varying instructional methods periodically throughout class sessions helps to engage and hold trainees' attention. The *Core Curriculum* PowerPoint® presentation that you received with this lesson plan is keyed to the sections of the Trainee Guide indicated below and has been designed for use with this lesson plan.

Review

Review the answers to the 1.0.0 and 2.0.0 Section Reviews.

Classroom: Sections 2.0.0–2.1.0

Explain the difference between fall prevention and fall arrest. Introduce the different methods used to prevent falls and the different methods of fall arrest. Point out the difference between falls from an elevation and falls on the same level. Discuss the rules for use of fall arrest equipment.

Classroom: Sections 2.1.1–2.1.2

Explain how good housekeeping practices can prevent slips, trips, and falls. Discuss the various methods used to prevent falls caused by unprotected sides, wall openings, and holes in the floor. Explain the barricade color codes used to designate different levels of hazards. Discuss the rules for protecting openings in floors, walls, and stairways, as well as the edges of decks and platforms.

Classroom: Sections 2.2.0–2.2.1

Use the figure to point out and describe each item of a personal fall arrest system. Use *Figure 8* to introduce the different types of permanent and temporary anchor points. Explain swing zone and how it is affected by anchor position in relation to the fall protection harness. Discuss the differences between anchor points and positioning connections. Emphasize that a positioning lanyard cannot take the place of a fall arrest lanyard and must not be connected to the D-rings reserved for the fall protection lanyard.

Classroom: Sections 2.2.2–2.2.3

Explain that fall protection harnesses are made in several sizes and that it is important to use the correct size. Explain why proper positioning of the back D-ring is critical. Have examples of connecting devices such as carabiners and double-locking snap hooks available for the trainees to examine. Describe the purpose of a suspension trauma strap and explain how it is used. Point out that fall arrest equipment must be inspected before each use, as well as monthly by a competent person.

Demonstration

Show the trainees how to inspect fall arrest harnesses, lanyards, and connecting devices. If possible, provide a harness that has failed inspection in order to make the activity more realistic. Then demonstrate how to correctly put on and adjust a fall protection harness with the back D-ring in the correct position.

Laboratory/Performance Task

Provide the trainees with fall arrest harnesses, lanyards and connecting devices. Have the trainees inspect a fall protection harness, lanyard, and connecting devices. This activity corresponds to a portion of Performance Task 2.

Have the trainees don, fit, and remove a fall protection harness. This activity corresponds to a portion of Performance Task 3.

Classroom: Section 2.2.4

Explain the difference between shock-absorbing and self-retracting lanyards. Point out that non-shock-absorbing lanyards are used only for positioning and explain why. Emphasize that lanyards must never be field-fabricated and must never be connected together or tied in a knot. Explain that a lanyard must never be wrapped around a structure and choked back on itself unless designed for that purpose like a tieback lanyard.

Use the figure to show how fall distances are calculated. Point out the difference between self-retracting and shock-absorbing lanyards in that regard.

Classroom: Section 2.2.5

Explain that vertical and horizontal lifelines are used to allow movement. Point out that the minimum breaking strength of a horizontal lifeline is determined by the number of workers to be attached to it and that this determination must be made by a competent person. Advise the trainees to check with a supervisor before attaching to a horizontal lifeline.

Classroom: Sections 2.2.6–2.2.7

Describe how guard rails are used for fall prevention. Point out that a securely fastened toeboard is needed to prevent material or tools from inadvertently falling. Explain that safety nets are used for fall protection in some situations and that they must meet strict standards for capacity and positioning.

Classroom: Section 2.3.0

Discuss maximum intended load for ladders and point out that this weight limit, which includes personnel, tools, and materials, must not be exceeded. Use *Table 2* to compare loads for different types of ladders.

Classroom: Section 2.3.1

Identify the components of a straight ladder. Point out that metal ladders must not be used around electrical wiring or electrical installations. Discuss the differences in weight and applications between wood, aluminum, and fiberglass ladders. Explain that wooden ladders should never be painted because the paint can hide damage.

Use the figures to show how to properly place and secure a ladder. Describe how to climb and descend a ladder using three points of contact. Explain that tools and materials should not be carried on a ladder, but should be raised and lowered using a hand line or tag line.

Classroom: Section 2.3.2

Explain how extension ladders are raised and lowered. Emphasize the importance of making sure the rung locks are secure once the extension is raised. Discuss the minimum overlap requirement based on the height of the ladder and point out the importance of leaving the extension stop in place. Point out that no one should stand higher than the fourth rung from the top of an extension ladder.

Classroom: Section 2.3.3

Bring a stepladder into the classroom so trainees can examine it. Describe the component parts of a step ladder. Show how to properly set up a step ladder, making sure that it is placed on a level surface. Explain that one should never stand on the top rung or try to climb the back of the ladder. The knees should never be above the top rung. Also point out that step ladders, like other types of ladders, have maximum load limits.

Classroom: Sections 2.3.4–2.3.5

Describe how to properly inspect a ladder, looking for loose nails, screws, and other loose hardware; frayed or worn ropes and defective rung locks on extension ladders; and oil, grease, or dirt on the rungs of ladders.

Explain that stairs rising more than 30 inches must have railings on open sides. Point out the importance of having adequate lighting on stairs. Explain that large or heavy items should not be carried on stairs; a crane or other lifting method such as an elevator should be used.

Classroom: Sections 2.4.0–2.4.1

Identify the different types of scaffolds. Point out that only a competent person can approve the use of scaffolds and must inspect them before use. Warn the trainees that rolling scaffolds may not be moved while workers are on them.

Classroom: Sections 2.4.2–2.4.3

Describe the tagging system used to identify the status of a scaffold. Note that a yellow tag requires that workers wear fall protection. Point out that scaffolds should be inspected before every use despite the presence of a green tag. Provide examples of scaffold tags for the trainees to examine. Explain that scaffolds, like ladders, have weight limits and that scaffolds more than 10' high must have top rails, mid-rails, and toeboards and all connections must be pinned. Describe how matting or planks are used to stabilize scaffolds placed on loose or soft soil. Review the minimum distance requirement from power lines.

Wrap Up

Review the Trade Terms associated with Section 2.0.0 to reinforce the material that was presented. Ask trainees to identify any terms that were new to them or meant something different than they expected. Time permitting, show fall protection videos available at the **osha.gov website**.

Homework

Assign the reading of Sections 3.0.0 through 4.2.1. In addition, ask trainees to complete the 3.0.0 and 4.0.0 Section Reviews.

Safety Considerations

The following safety consideration should be emphasized in this session:

Remind trainees that some forms of PPE are required any time they are in the shop or job site environments.

Safety Equipment

No specific safety equipment is required for this session.

Classroom and/or Lab Equipment

Double-insulated power tool
Ground fault circuit interrupter (GFCI)
Damaged and undamaged extension cords

Resources

No specific resources are required for this session.

Session Objectives

When trainees have completed this session, they should be able to do the following:

3. Identify and explain how to avoid struck-by and caught-in-between hazards.
   a. Identify and explain how to avoid struck-by and caught-in-between hazards.
   b. Identify and explain how to avoid caught-in and caught-between hazards.
4. Identify common energy-related hazards and explain how to avoid them.
   a. Describe basic job-site electrical safety guidelines.
   b. Explain the importance of lockout/tagout and describe basic procedures.

Session Performance Requirements

By the end of this session, trainees should have completed, or be able to complete, the following Performance Task under the supervision of the instructor:

Inspect a typical power cord and GFCI to ensure their serviceability.

Instructors are reminded that trainee performance during practice and laboratory sessions can be used for verification of Performance Task completion.

Instructional Outline

Research has shown that varying instructional methods periodically throughout class sessions helps to engage and hold trainees' attention. The *Core Curriculum* PowerPoint® presentation that you received with this lesson plan is keyed to the sections of the Trainee Guide indicated below and has been designed for use with this lesson plan.

Review

Review the answers to the 3.0.0 and 4.0.0 Section Reviews.

Classroom: Sections 3.0.0–3.1.1

Explain the difference between struck-by and caught-in/between hazards and give examples of each. Describe the different ways in which workers can be struck by falling objects. Discuss the importance of barricading areas where falling objects may be a hazard. Explain how toeboards, debris nets, and other measures are used to prevent falling tools and other objects. Explain how to use the interlocking method to stack material.

Classroom: Section 3.1.2

Describe the various ways in which workers can be harmed by flying objects while using power tools. Review the case histories from this section to emphasize the types of incidents that can occur. Discuss the importance of using eye and face protection, protective tool guards, and training in the use of certain tools.

Classroom: Section 3.1.3

Point out the hazards that exist from moving vehicles and equipment on a job site, especially from those operating in reverse. Explain why maintaining eye contact with vehicle and equipment operators and listening for backup alarms is important. Use the bulleted list in the text to review the safety requirements for vehicle and equipment operators.

Classroom: Sections 3.2.0–3.2.1

Describe the hazards related to trenches and excavations, including cave-ins, water accumulation, falling objects, and hazardous atmospheres. Remind the trainees that more than 1,000 trench cave-ins occur every year and that the fatality rate is much higher than that for other types of hazards. Explain how changing soil conditions can affect a trench. Discuss the warning signs that can indicate the potential for a trench collapse.

Use the table to describe the different types of soils and their stability. Point out that a competent person must inspect a trench every day and must select a protection system suitable for the soil type and operating conditions. Describe the different protective methods, including sloping, benching, shoring, and shielding and the conditions under which each type is used.

Explain the proper placement of a spoil pile in relation to an excavation. Describe the approved methods for entering and exiting a trench. Point out that ladders must be available every 25 feet if the trench is more than 4' deep.

Classroom: Section 3.2.2

Discuss the purpose of tool and machine guards and identify the types of tools that typically require protective guards. Describe how guards are applied to moving and rotating machinery. Emphasize that protective guards must never be removed or bypassed. Use the example of the guard on a circular saw being held back to expose the blade. Point out that only the guard designed for a tool or machine should be used on it.

Classroom: Section 3.2.3

Describe the hazards associated with cranes and heavy equipment. Identify common pinch points on equipment such as excavators and backhoes. Explain how the upper rotating structure of some equipment, such as cranes and excavators, extend beyond the tracks, creating a caught-between hazard.

Classroom: Sections 4.0.0–4.1.0

Explain what lockout/tagout is and point out that any source that can release energy—electrical, pneumatic, hydraulic, thermal, etc.—is subject to LOTO requirements. Describe the different hazards that can result from exposure to an electrical energy release.

Use the table to discuss the effects of an electric shock. Emphasize that even a small electric current can result in death.

Classroom: Sections 4.1.1–4.1.2

Explain what a ground is and why grounding is an important safety feature. Discuss the purpose of a three-wire system and explain how double-insulated tools provide protection against electric shock. Show the trainees a double-insulated power tool and point out the polarized two-prong plug.

Explain the purpose of a GFCI and briefly describe how it works. Show the trainees a GFCI and point out the test and reset buttons. Explain that a GFCI should be tested before use. Point out that a GFCI-protected device must not be plugged into a GFCI.

Classroom: Sections 4.1.3–4.1.5

Review the summary of electrical safety guidelines. Point out that work on electrical equipment should be done whenever possible with circuits de-energized and locked out. Discuss the case history in the text and ask trainees to describe how the incident could have been avoided; e.g., inspecting and replacing the extension cord; using a wooden or fiberglass ladder; using a GFCI. Explain what proximity work is and give examples. Point out that minimum distances from electrical devices have been established and must be respected. Discuss the hazards associated with overhead power lines and how these hazards are avoided. Point out that in the event someone is shocked, the best action is to turn off power as quickly as possible and not to touch someone who is being shocked.

Classroom: Section 4.2.0–4.2.1

Explain that some hydraulic, pneumatic, and electrical systems retain stored energy even after being disabled. Show the trainees some lockout-tagout devices and explain how they are used. Discuss the different types of lockout devices. Describe the rules for placing and removing locks and tags. Point that working around hot or pressurized systems is considered proximity work and requires extreme care. Barricades and/or monitors may be necessary to protect workers.

Demonstration

Show the trainees how to inspect an electrical extension cord and how to inspect and test a GFCI. Point out reasons to reject power cords.

Laboratory/Performance Task

Have the trainees inspect a power cord, and then inspect and test a GFCI. Provide cords that are serviceable as well as those that are not. This activity corresponds to Performance Task 4.

Wrap Up

Review the Trade Terms introduced in this session to help reinforce learning. Ask trainees if they have any questions about the session.

Homework

Assign the reading of Sections 5.0.0 through 6.5.0. In addition, ask trainees to complete the 5.0.0 and 6.0.0 Section Reviews.

Safety Considerations

The following safety consideration should be emphasized in this session:

Remind trainees that some forms of PPE are required any time they are in the shop or job site environments.

Safety Equipment

No specific safety equipment is required for this session.

Classroom and/or Lab Equipment

Provide both defective and serviceable examples of the following items:

– Eye protection, such as safety glasses and face shields
– Hearing protection, including ear plugs and ear muffs
– Hard hats
– Work gloves

Various types of respirators

Resources

Refer to **www.osha.gov** for more information on PPE and site safety, including a number of videos on both topics.

Session Objectives

When trainees have completed this session, they should be able to do the following:

5. Identify and describe the proper use of personal protective equipment (PPE).
   a. Identify and describe the basic use of PPE used to protect workers from bodily injury.
   b. Identify potential respiratory hazards and the basic respirators used to protect workers against those hazards.
6. Identify and describe other specific job-site safety hazards.
   a. Identify various exposure hazards commonly found on job sites.
   b. Identify hazards associated with environmental extremes.
   c. Identify hazards associated with hot work.
   d. Identify fire hazards and describe basic firefighting procedures.
   e. Identify confined spaces and describe the related safety considerations.

Session Performance Requirements

By the end of this session, trainees should have completed, or be able to complete, the following Performance Tasks under the supervision of the instructor:

Inspect the following PPE items and determine if they are safe to use:

- Eye protection
- Hearing protection
- Hard hat
- Gloves
- Approved footwear

Properly don, fit, and remove the following PPE items:

- Eye protection
- Hearing protection
- Hard hat
- Gloves

Instructors are reminded that trainee performance during practice and laboratory sessions can be used for verification of Performance Task completion.

Instructional Outline

Research has shown that varying instructional methods periodically throughout class sessions helps to engage and hold trainees' attention. The *Core Curriculum* PowerPoint® presentation that you received with this lesson plan is keyed to the sections of the Trainee Guide indicated below and has been designed for use with this lesson plan.

Review

Review the answers to the 5.0.0 and 6.0.0 Section Reviews.

Classroom: Sections 5.0.0–5.1.0

Discuss the importance of wearing the required PPE at all times. Point out that some companies take strong disciplinary action against someone violating PPE rules and that it may even be grounds for immediate dismissal. Explain that PPE must be properly cared for, properly worn, regularly inspected, and never altered.

Classroom: Section 5.1.1

Provide hard hats for the trainees to examine. Point out the outer shell, webbing, and adjustment and explain the proper way to wear the hat. Discuss the importance of inspecting the hard hat and keeping it clean.

Classroom: Section 5.1.2

Discuss the different types of eye and face protection and provide examples for the trainees to examine. Describe the situations in which full face protection is required. Point out that special tinted goggles are required for anyone performing or working in proximity to welding or flame cutting.

Classroom: Sections 5.1.3–5.1.4

Provide a selection of approved work gloves for the trainees to examine. Point out that gloves are rated for certain hazards. Emphasize how important it is to wear gloves at all times except when working around rotating equipment. Explain that boots with safety toes are the required footwear for most jobs, but some tasks require specialized footwear. Point out that boots must be frequently inspected and must be replaced when worn or damaged.

Classroom: Section 5.1.5

Describe how excessive noise can damage hearing. Provide examples of ear plugs and ear muffs for the trainees to examine. Use the table to discuss the sound levels that might be experienced on a job site and the maximum exposure time associated with each.

Classroom: Section 5.2.0

Discuss the conditions under which a respirator may be required. Explain where silica dust comes from and the harmful effects that can result from inhaling it. Explain what asbestos is, where it is found, and the hazards associated with it. Point that asbestos can only be handled by trained and certified workers.

Classroom: Sections 5.2.1–5.2.3

Provide examples of respirators for the trainees to examine. Discuss the different types of respirators and their uses. Explain that, if respirators are required on the job, the employer must provide the necessary equipment and training in how to use it. Point out that respirators are effective only if they fit properly.

Demonstration

Show the trainees how to properly inspect, don, and remove eye protection, gloves, hard hat, and hearing protection. Point out causes for rejection in common PPE.

Laboratory/Performance Task

Have the trainees demonstrate their ability to properly inspect, don, and remove eye protection, gloves, hard hat, and hearing protection. This activity corresponds to Performance Tasks 2 and 3.

Classroom: Sections 6.0.0–6.1.1

Explain how the HAZCOM standard applies to workers who may be exposed to chemical, biological, or physical hazards on the job. Point out that exposure to hazardous materials may come through inhalation, ingestion, or absorption. Explain what PEL is.

Describe the sources of lead and the hazards related to contact with lead on a job site, especially inhalation or ingestion of dust caused by disturbing lead-based paint. Explain that lead-based paints were used until 1978.

Classroom: Section 6.1.2

Explain what bloodborne pathogens are and how a person can come into contact with them. Point out that exposure to bloodborne pathogens can be prevented by wearing protective clothing, masks, and gloves and washing affected areas with soap and water.

Classroom: Sections 6.1.3–6.1.4

Give the trainees examples of chemicals that can be encountered on a job site and describe the various hazards associated with chemical spills, such as release of toxic vapors, explosion, or fire. Remind the trainees to check the related SDS for any chemical they encounter so they will

Describe the chemical labeling requirements under the GHS. Discuss the NFPA and USDOT labeling standards using the figures in the TG.

Classroom: Sections 6.1.5–6.1.6

Identify sources of radiation and the symbols used to identify radiation hazards. Discuss signs used to identify biological hazards.

Classroom: Section 6.1.7

Explain that evacuation of a job site may be necessary in the event of a chemical spill, explosion, fire, gas leak, or other incident. Emphasize that workers must be familiar with audible warnings, locations of emergency phones, and evacuation routes.

Classroom: Sections 6.2.0–6.2.4

Explain what heat stress is and identify its symptoms. Describe the causes and symptoms of heat cramps. Point out that it is critical to drink plenty of liquids when working in hot conditions, but to avoid alcoholic beverages. Explain the difference between heat exhaustion and heat stroke and compare the symptoms. Discuss the treatments for these conditions.

Classroom: Sections 6.2.5–6.2.7

Describe the symptoms of cold stress. Explain that dressing in layers is the best way to avoid cold stress and that dry clothes should be carried in case of damp weather. Describe the symptoms and first aid treatment for frostbite. Explain how hypothermia can occur and review its symptoms. Describe how to treat a person with symptoms of hypothermia. Refer the trainees to the text and discuss the actions to take if someone falls into the water.

Classroom: Sections 6.3.0–6.3.1

Identify the activities that qualify as hot work. Briefly explain how arc welding is performed and discuss the hazards from heat and radiation. Point out that anyone working near an arc welding operation must wear shaded eyewear appropriate to the hazard level and that welding screens may also be necessary to protect nearby workers. Discuss the symptoms of flash burns.

Classroom: Sections 6.3.2–6.3.3

Explain how oxygen combines with a cutting gas such as acetylene to produce a flame hot enough to melt metal. Briefly explain what brazing is and how it is used to join copper pipe. Discuss the importance of properly handling and storing fuel gases under pressure. Point out that protective caps must always be in place on gas cylinders when they are not in use and that the cylinders must be secured to keep them from falling over. Discuss the proper methods for transporting and lifting fuel gas cylinders.

Classroom: Section 6.3.4

Explain what a hot work permit is and why it is necessary. Discuss the importance of posting a fire watch when hot work is being performed and explain the duties of a fire watch.

Classroom: Sections 6.4.0–6.4.2

Use the fire triangle to describe the conditions necessary for a fire to start and be sustained. Describe the different types of combustible materials and how they are classified. Emphasize the importance of keeping pressurized gas cylinders away from sources of heat.

Classroom: Section 6.4.3

Review the basic safety guidelines for fire prevention. Discuss the techniques used to prevent fire when working with flammable or combustible liquids, flammable gases, and ordinary combustibles. Point out the hazards of allowing oxygen to come into contact with oil or grease.

Classroom: Section 6.4.4

Explain the importance of knowing where fire extinguishers are located and the procedures to be followed in case of a fire. Explain how fire extinguishers are classified for specific types of fires and why this is necessary. Ask a trainee what might happen if a Class A fire extinguisher is used on an electrical fire. Show and explain the pictograms provided on fire extinguishers. Point out that dry-chemical fire extinguishers are common because they can be used on Class A, B, and C fires. Discuss the hazards of using a CO_2 extinguisher on a Class D fire. Point out that fire extinguishers must be periodically inspected and show how to determine if an extinguisher is fully charged.

Classroom: Section 6.4.5

Explain the PASS method for fighting a fire and describe how to properly use a fire extinguisher.

Classroom: Section 6.5.0

Explain what a confined space is and give examples. Explain how a permit-required confined space is different and what must be done before it is entered. Describe what oxygen-deficient and oxygen-enriched spaces are and discuss the related hazards. Point out that an attendant must be present when a confined space is entered and that the attendant must remain outside a permit-required confined space. Explain why special care is needed when using flammable or inert gases in a confined space.

Wrap Up

Review the Trade Terms introduced in this session to verify that the trainees are familiar with the terms. Ask trainees if they have any questions about the session.

Homework

Advise the trainees to review the procedures for setting-up, climbing, and descending a ladder in order to prepare for the Performance Task in the next session.

Assign a review of the complete module text to prepare for the module examination. It is further suggested that the trainees complete the Module Review and Trade Terms Quiz as homework.

Laboratory; Review and Testing

This session includes a brief review of the module, administering the module examination, and performance testing.

Safety Considerations

The following safety consideration should be emphasized in this session:

Remind trainees that some forms of PPE are required any time they are in the shop or job site environments.

Safety Equipment

The following safety equipment is recommended for this session:

Eye protection
Work gloves
High-top safety shoes
Hearing protection
Hard hat

Classroom and/or Lab Equipment

Extension ladder
Copies of the Module Examination and Performance Profile sheets
Have the Module Review and Trade Terms Quiz answer key available for review prior to administering the exam.

Resources

Area with a wall suitable for the erection and climbing of an extension ladder.

Session Objective

This laboratory is designed to support and emphasize the content of Learning Objective 2.

Session Performance Requirements

By the end of this session, trainees should have completed, or be able to complete, the following Performance Tasks under the supervision of the instructor:

Properly set up and climb/descend an extension ladder, demonstrating proper three-point contact.

Instructors are reminded that trainee performance during practice and laboratory sessions can be used for verification of Performance Task completion.

Instructional Outline

This laboratory is devoted to the practice and completion of Performance Tasks required for this module, in addition to the module exam. As a result, no PowerPoint® slides have been developed for this session. Throughout these activities, ensure that trainees wear the proper PPE and exhibit safe working habits.

Demonstration

Show the trainees how to properly erect and secure an extension ladder. Then demonstrate how to safely climb and descend the ladder using three points of contact.

Laboratory/Performance Task

Have the trainees practice properly erecting and securing an extension ladder and climbing/descending the ladder using three points of contact. It is suggested that trainees wear all common PPE during this laboratory, to simulate normal construction site behavior. This activity corresponds to Performance Task 1.

Review

Ask the trainees if they wish to review any particular information from the module. Have the trainees complete the Review Questions and Trade Terms Quiz at the end of the module. Alternatively, if the Review Questions and/or Trade Terms Quiz were assigned as homework, have them retrieve their answers. Review the answers to both the Review Questions and Trade Terms Quiz prior to administering the module exam. Ask again if the trainees need clarification on any particular knowledge areas.

Examination and Performance Testing

Administer the Module Exam. Allow one to two minutes per test item for the written exam. As they begin, remind trainees that they must answer at least 70 percent of the questions correctly to pass the module exam.

Administer any outstanding performance tests and complete the Performance Profile Sheet for each trainee.

Wrap Up

Ask the trainees if there were any problem areas on the exam and to identify a favorite and least favorite part of this module. As an alternate or if time allows, briefly introduce the next topic in your planned teaching sequence.

Homework

Assign the reading of the next module in the teaching sequence.

Instructor

Record the testing results on the Registration of Training Modules Form, and submit the report to your Training Program Sponsor.

SECTION REVIEW ANSWER KEY

SECTION 1.0.0

Answer		Section Reference	Objective
1.	c	1.0.0	1a
2.	d	1.2.1	1b
3.	a	1.3.5	1c

SECTION 2.0.0

Answer		Section Reference	Objective
1.	c	2.1.2	2a
2.	a	2.2.1	2b
3.	b	2.3.1	2c
4.	c	2.4.2	2d

SECTION 3.0.0

Answer		Section Reference	Objective
1.	a	3.1.2	3a
2.	d	3.2.1	3b

SECTION 4.0.0

Answer		Section Reference	Objective
1.	b	4.1.1	4a
2.	b	4.2.0	4b

SECTION 5.0.0

Answer		Section Reference	Objective
1.	a	5.1.2	5a
2.	d	5.2.0	5b

SECTION 6.0.0

Answer		Section Reference	Objective
1.	b	6.1.0	6a
2.	c	6.2.5	6b
3.	a	6.3.1	6c
4.	b	6.4.1	6d
5.	b	6.5.0	6e

ANSWERS TO REVIEW QUESTIONS

	Answer	Section Reference
1.	b	1.1.1
2.	b	1.2.1
3.	a	1.2.9
4.	c	1.2.9
5.	a	1.3.0
6.	a	1.3.0
7.	c	1.3.4
8.	c	2.3.1
9.	b	2.3.1
10.	a	2.4.1
11.	d	3.1.1
12.	b	3.1.1
13.	b	3.1.3
14.	b	3.2.1
15.	d	3.2.1
16.	b	3.2.1
17.	d	3.2.1
18.	b	3.2.2
19.	a	4.1.4
20.	c	4.1.4
21.	a	4.2.0
22.	c	5.1.2
23.	c	5.2.1
24.	b	6.1.0
25.	b	6.2.7
26.	a	6.3.2
27.	c	6.3.2
28.	b	6.4.1
29.	a	6.4.4; Figure 72
30.	a	6.5.0

ANSWERS TO TRADE TERMS QUIZ

1. Lockout/tagout (LOTO)
2. Excavation
3. Competent person
4. Confined space
5. Flammable
6. Osha
7. Flash burn
8. HAZCOM
9. Flash point
10. Ground
11. Hand line
12. Planked
13. Lanyard
14. Shoring
15. SDS
16. Maximum intended load
17. Signaler
18. Permit-required confined space
19. Trench
20 Midrail
21. PPE
22. Qualified person
23. Respirator
24. Scaffold
25. Proximity work
26. Toeboard
27. Wind sock
28. Top rail
29. Six-foot rule
30. Management system
31. Arc welding
32. Pneumatic
33. Cross-braces
34. Safety culture
35. Spoil
37. Guarded
37. Ground fault
38. GFCI
39. Hydraulic
40. Accident
41. Welding curtain
42. Brazing
43. Combustible
44. Shielding
45. Incident

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