

## Lesson Plans for Module 29101-15

# WELDING SAFETY

**Module One (29101-15)** introduces trainees to the all-important topic of safety in the welding trade. The work of welders includes joining pipe sections for oil and natural gas pipelines; building ships; and working in a variety of industrial environments such as power plants, refineries, chemical plants, and manufacturing facilities.

### Objectives

#### Learning Objective 1

- Describe basic welding processes, the welding trade, and training/apprenticeship programs.
  - a. Describe basic welding processes and the welding trade.
  - b. Describe NCCER standardized training and explain apprenticeship programs.

#### Learning Objective 2

- Identify, and describe personal protective equipment (PPE) related to the welding trade.
  - a. Identify and describe body, foot, and hand protective gear.
  - b. Identify and describe ear, eye, face, and head protective gear.

#### Learning Objective 3

- Identify and describe welding safety practices related to specific hazards or environments.
  - a. Describe the importance of welding safety and identify factors related to accidents.
  - b. Describe basic welding safety practices related to the general work area.
  - c. Describe hot work permits and fire watch requirements.
  - d. Describe confined spaces and their related safety practices.
  - e. Identify safety practices related to welding equipment.
  - f. Identify and describe respiratory hazards, respiratory safety equipment, and ways to ventilate welding work areas.
  - g. Explain the purpose of the SDS/MSDS and how it is used.

#### Performance Tasks

This is a knowledge-based module; there are no performance tasks.

### Teaching Time: 5 hours

(Two 2.5-Hour Classroom Sessions)

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

### Prerequisites

Core Curriculum

### 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](http://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

This module is primarily delivered in the classroom environment. However, some activities are likely to be conducted in shop areas and require trainees to handle common welding materials and tools. Safety must be emphasized at all times. Trainees should be carefully observed to ensure that they wear the proper PPE, follow safe practices, and give due respect to unseen hazards. Any deficiencies must be corrected to ensure future trainee safety.

## Classroom Equipment and Materials

Whiteboard/chalkboard	Common welding PPE, including:
Markers/chalk	Welding hood
Pencils and paper	Head gear
<i>Welding Level One</i> PowerPoint®	Face shield
Presentation	Jacket
DVD player or a computer with a DVD drive	Apron
LCD projector and screen	Cape
Computer with Internet access	Arm covers
Examples of SDSs/MSDSs	Chaps
Copies of the Module Examination	Spats
	Tinted hood lenses
	Various types of respirators

## Additional Resources

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

*Arc Welding Safety E205*. Latest Edition. Cleveland, OH: Lincoln Electric.

*Ventilation Guide for Weld Fumes AWS F32M/F32*. Latest Edition. Miami, FL: American Welding Society.

*Safety Topics in Welding, Cutting, and Brazing*. [www.osha.gov](http://www.osha.gov).

*Personal Protective Equipment (PPE) for Welding and Cutting*. Miami, FL: American Welding Society.

*ANSI/AWS Z49.1, Safety in Welding, Cutting, and Allied Processes*. Miami, FL: American Welding Society.

*Lincoln Electric Company* [www.lincolnelectric.com](http://www.lincolnelectric.com).

There are a number of on-line resources available for trainees who would like more information on this topic. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. There are a number of accessible videos related to welding safety on the Internet. Lincoln Electric Company offers a number of short, well-produced videos related to welding safety. The collection of videos can be found by visiting <http://www.lincolnelectric.com/assets/us/en/interactive/welding-safety/ppe-home.html>. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

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

# WELDING SAFETY

The Lesson Plan for this module consists of two 2.5-hour sessions. This time includes 10 minutes for administrative tasks and a 10-minute break for each session.

## SESSION ONE

Session One covers the first two objectives. It begins with acquainting the trainees with the welding trade and training required for it, and continues through selection and proper fit of PPE.

1. Use the Kickoff Activity to engage trainees in the topic and give them an idea of what they will learn from this session.
2. Show the Session One PowerPoint® presentation.
3. Define the welding processes and discuss the welding trade.
4. Review apprenticeship programs.
5. Describe and point out the differences between SMAW, GTAW, and GMAW.
6. Present welding-related PPE.
7. Introduce hot work permits, fire watches, and confined space operations.

## SESSION TWO

Session Two presents various welding safety practices related to different environments and processes. At the end of this session, trainees will complete the written module examination.

1. Show the Session Two PowerPoint® presentation.
2. Use the Kickoff Activity to review Session One and introduce Session Two.
3. Discuss why it is important to practice welding safety.
4. Introduce the safety data sheets (SDSs) and material safety data sheets (MSDSs).
5. Administer the written examination.
6. Record the testing results on the Registration of Training Modules form, and submit the report to your Training Program Sponsor.



**Materials Checklist for Module 29101-15, Welding Safety**

Equipment and Materials				
<b>Personal protective equipment:</b>		Common welding PPE, including:		
None		Welding hood		
Whiteboard/chalkboard		Head gear		
Markers/chalk		Face shield		
Pencils and paper		Jacket		
<i>Welding Level One</i> PowerPoint® Presentation Slides		Apron		
DVD player		Cape		
Computer		Arm covers		
Examples of SDSs/MSDSs		Chaps		
Copies of the Module Examination		Spats		
		Tinted hood lenses		
		Various types of respirators		

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.

