Introduction to the Plumbing Profession

Lesson Plans for Instructors

Module 02101

02101

Introduction to the Plumbing Profession

Plumbing

Lesson Plans for Instructors

Trainees with successful module completions may be eligible for credentialing through the NCCER Registry. To learn more, go to www.nccer.org or contact us at 1.888.622.3720. Our website has information on the latest product releases and training, as well as online versions of our Cornerstone magazine and Pearson's product catalog.

Your feedback is welcome. You may email your comments to curriculum@nccer.org, send general comments and inquiries to info@nccer.org, or fill in the User Update form at the back of this module.

This information is general in nature and intended for training purposes only. Actual performance of activities described in this manual requires compliance with all applicable operating, service, maintenance, and safety procedures under the direction of qualified personnel. References in this manual to patented or proprietary devices do not constitute a recommendation of their use.

Overview

Plumbers protect the health, safety, and comfort of people. Training and critical-thinking skills are essential to being a good plumber. A professional work ethic and good safety habits go a long way toward adding to the success of a plumber.

Learning Objective 1

Successful completion of this module prepares trainees to:

Describe the plumbing profession.

a. Describe the history of the plumbing profession.
b. Describe the plumbing profession today.

Learning Objective 2

Successful completion of this module prepares trainees to:

Identify the responsibilities of a person working in the plumbing industry.

a. State the personal characteristics of a professional.

b. Identify career opportunities in plumbing.

Performance Tasks

This is a knowledge-based module; there are no Performance Tasks.

Recommended Teaching Time: 5 hours

This Lesson Plan (LP) is divided into sections that correspond to the sections in the Trainee Guide module. As you plan your class times, review the objectives, content, and lesson plan outline for the section you plan to teach. Allow sufficient class time for demonstrations, laboratories, field trips, and testing. Each class period should also include time for administrative tasks and periodic breaks.

Be sure to gather the required equipment, materials, visual aids, and answer keys. Using your access code, download the PowerPoint® presentations and Performance Sheets for this module from NCCER's Instructor Resource Center at www.nccerirc.com.

It is advisable to assign the reading of a module section prior to the classroom instruction. The Section Review and Module Review questions may be assigned as homework. At their discretion, instructors may assign additional homework to meet the teaching objectives.

Performance Testing may be administered at any suitable time in the course of the module training. Tasks are graded pass/fail. Trainee performance and proficiency during practice sessions that meets or exceeds the standards for a task can be accepted as Performance Task completion. Complete the Performance Profile Sheet for each trainee.

The final class is generally reserved for a brief review and the Module Examination. For information and updates about accessing the Module Examinations, visit www.nccer.org/testing. The passing score for submission into NCCER's Registry is 70% or above for the Module Exam. Record the testing results for each trainee on the Registration of Training Modules form and submit the form to the Training Program Sponsor.

Prerequisites

Core Curriculum

Safety Considerations

This module will likely be taught exclusively in the classroom environment. However, instructors may teach or demonstrate portions of it in the shop or in the vicinity of functioning equipment. Electrical and mechanical 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 the hazards of energized and operating systems. Any work performed on functioning equipment must be completed under the direct supervision of the instructor.

Classroom Equipment and Materials

- Whiteboard and markers
- Pencils and paper
- PowerPoint® Presentations for Module 02101
- A variety of standard marker sizes
- Poster board

- Flip chart
- LCD projector and screen
- Computer with Internet access
- Module Review answer key
- Module Examinations

Instructional Methods

Instructional methods research has shown that varying instructional methods periodically throughout class sessions helps to engage and hold trainees' attention. The 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.

Additional Resources

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

Plumbing a House, 1998. Peter A. Hemp. Newtown, CT: Taunton Press.

The National Standard Plumbing Code, current edition. Falls Church, VA: Plumbing-Heating-Cooling Contractors Association.

There are a number of online resources available for trainees who would like more information about the module 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. The videos can provide examples of 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.

Numerous videos related to the topic are available on the Internet. These can be located by using various search terms relevant to the topic, then selecting the Video tab on the results page of your preferred search engine.

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

Section One

The Plumbing Profession

Objective

Successful completion of this module prepares trainees to:

Describe the plumbing profession.

a. Describe the history of the plumbing profession.

b. Describe the plumbing profession today.

Kickoff Activity

Have your trainees get into groups of three for three to four minutes and have each one discuss their interest in plumbing, prior experience, and knowledge they already have. Once the discussion is over, give them your background in plumbing and why you're teaching.

Sections 1.0.0–1.1.3

Describe how plumbing evolved from ancient times to modern times.

Teaching Tip

Select a few of the trade terms for Section 1.0.0 and write them on the board. Ask individual trainees to give broad definitions of the terms. Ask if there are any terms they would like to have further explained.

Sections 1.2.0–1.2.3

Describe the responsibilities of plumbers and discuss the other crafts that require similar skills, such as pipefitters and sprinkler fitters. Describe the types of work performed by plumbers.

Section 1.2.4–1.2.5

There are three phases of plumbing: underground rough-in, aboveground rough-in, and finish. Discuss the three phases and the importance of each phase.

Teaching Tip

Break students into three groups and assign each group one of the phases of a plumbing project. Have them determine what codes they would need to be prepared to know for their particular phase and how it impacts a job.

Wrap Up Activity

Exit Slip: have your students fill-out a notecard with one thing they learned and one question they have about plumbing after teaching section one.

Section Two

Responsibilities of a Plumbing Professional

Objective

Successful completion of this module prepares trainees to:

Identify the responsibilities of a person working in the plumbing industry.

a. State the personal characteristics of a professional.

b. Identify career opportunities in plumbing.

Sections 2.0.0–2.1.9

Describe the personal characteristics needed for someone to become successful.

Teaching Tip

Have trainees break into groups based on what they identify as their *weakest* quality out of the eight qualities a plumber must exhibit. Have them discuss ways in which they can improve this quality to become a well-rounded plumber.

Sections 2.2.0–2.2.6

Describe the range of opportunities available to someone who becomes a journey-level plumber. Explain the roles and responsibilities of different job positions in the industry. Explain how an apprentice program is structured and discuss the responsibilities of the apprentice and the sponsor.

Wrap Up Activity

Based on the various career possibilities, ask individual trainees which one they think they might pursue in the long term and why they chose it.

Laboratories/Performance Tasks

Safety Considerations

The following safety considerations should be emphasized as trainees complete the required Performance Tasks:

- Trainees will be required to handle and use various hand tools, power tools, and shop equipment. It is essential that instructors closely supervise each trainee as they use tools and operate equipment at this stage of training. Use each unsafe action observed as a teachable moment and demonstrate the safe use of tools and equipment at every opportunity.
- Ensure trainees have and wear the appropriate PPE for the tasks. Also ensure that they are properly clothed for operating power tools and shop equipment.
- Ensure that trainees wear gloves whenever possible to reduce the frequency of cuts and scrapes. This will help trainees become used to working with gloves in the future.

Module Performance Requirements

This is a knowledge-based module; there are no Performance Tasks.

Review and Testing

Module Review

Have the trainees complete the Review Questions and Trade Terms Quiz at the end of the module. Alternatively, if this was assigned as homework, have them retrieve their answers for both assignments. Go over the answers to both assignments prior to administering the Module Examination. Ask the trainees if they need clarification of any particular knowledge areas.

Examination

Administer the Module Examination. Allow one to two minutes per test item for the written exam. Remind the trainees that they must answer at least 70 percent of the questions correctly to pass the Module Examination.

Wrap Up Activities

Ask the trainees if there were any trouble areas on the exam. Ask each trainee about their favorite and least favorite parts of the module. As an alternative or if time allows, briefly introduce the next topic in your planned teaching sequence.

Instructor

Record the testing results as required for paper-based exams. The results for exams administered through the Testing Management System are recorded automatically in the Registry System.

Answer Keys

Section Review Answer Key

Section 1.0.0

Answer	Section Reference	Objective
1. c	1.1.1	1a
2. a	1.2.3	1b

Section 2.0.0

Answer	Section Reference	Objective
1. d	2.1.9	2a
2. d	2.2.1	2b

Module Review Answer Key

Answer	Section Reference
1. b	1.1.1
2. d	1.2.0
3. c	1.2.0
4. b	1.2.5
5. a	2.1.3
6. d	2.1.5
7. c	2.2.0
8. c	2.2.0
9. d	2.2.1
10. c	2.2.1
11. a	1.2.0
12. d	1.2.3
13. c	1.2.5
14. b	2.2.1
15. a	2.2.0

Trade Terms Quiz Answer Key

1. Underground rough-in
2. Filtration
3. Polyvinyl chloride (PVC)
4. Plumber
5. Drain, waste, and vent (DWV)
6. Chlorine
7. Softening
8. On-the-job training (OJT)
9. Potable
10. Model codes
11. Finish
12. Cross-connection
13. Disinfection
14. Aqueduct
15. Plumbarius
16. Ethics
17. Backflow
18. Thermoset
19. Aboveground rough-in
20. Thermoplastic
21. Code
22. Fixtures
23. Plumbum
24. Backflow preventer
25. Plumbing
26. Journey plumber
27. Appurtenances
28. Geothermal
29. Solar hot water
30. Aquifer depletion
31. United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Water efficiency
32. Rainwater harvesting Graywater Bioswale Reclaimed water