

MODULE OVERVIEW

This module provides the trainee with an overview of heavy equipment operation, operator responsibilities, and career opportunities. The module also covers basic principles of safety and engine operation.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain the basic terminology and types of equipment and their uses.
2. Identify career opportunities available to heavy equipment operators.
3. Explain the purpose and objectives of an apprentice training program.
4. Explain operator responsibilities and the characteristics of a good operator.
5. Explain the importance of safety in relation to heavy equipment.

PERFORMANCE TASKS

There are no performance tasks for this module.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Appropriate personal protective equipment

Copy of an employee manual

Job announcements for HEO from local newspapers (want ads)

OSHA Safety and Health Standards for the Construction Industry

Copies of the Trade Terms Quiz*

Module Examinations**

* Located in the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference work is suggested for both instructors and motivated trainees interested in further study. This is optional material for continued education rather than for task training.

Moving the Earth, Latest Edition. New York, NY: McGraw-Hill.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 5 hours are suggested to cover *Orientation to the Trade*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

| Topic | Planned Time |
|--|---------------------|
| Session I. Orientation to the Trade | |
| A. Introduction | _____ |
| B. Heavy Equipment Applications | _____ |
| C. Career Opportunities in Heavy Equipment | _____ |
| D. Your Training Program | _____ |
| E. Employee Responsibilities | _____ |
| Session II. Human Relations, Safety Roles, Review, and Module Examination | |
| A. Human Relations | _____ |
| B. Employer and Employee Safety Obligations | _____ |
| C. Review | _____ |
| D. Module Examination | _____ |
| 1. Trainees must score 70 percent or higher to receive recognition from NCCER. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |

MODULE OVERVIEW

This module provides a comprehensive overview of safety requirements on job sites with emphasis on OSHA and NIOSH requirements. It also presents basic requirements for personal protection, safely driving equipment, and HazCom.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Heavy Equipment Operations Level One, Module 22101-05*.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain the need for safety measures when working in and around heavy equipment.
2. State the purposes of signs, tags, barricades, and lockout/tagout devices when working on construction sites.
3. Identify safeguards used in a highway construction work zone.
4. Using a material safety data sheet (MSDS) for a hazardous chemical typically used with heavy equipment, state the long- and short-term health effects, first-aid measures, handling and storage, and/or required personal protective equipment.
5. State general guidelines for safe operation and maintenance of heavy equipment.
6. State general guidelines for safe transportation of heavy equipment.
7. State general guidelines for working safely around heavy equipment.
8. State the general dangers of working around an excavation area with heavy equipment.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Demonstrate how to put on various types of personal protection equipment: hardhat, goggles, and ear protection.
2. Place barricades and temporary traffic control devices for a highway construction zone.
3. Demonstrate how to use flags or paddles to control traffic.

MATERIALS AND EQUIPMENT LIST

| | |
|---|--|
| Overhead projector and screen | Temporary traffic control devices such as signs, barricades, and cones |
| Transparencies | Safety vest |
| Blank acetate sheets | Traffic control paddles or flags |
| Transparency pens | Copy of OSHA regulations |
| Whiteboard/chalkboard | OSHA job site posters |
| Markers/chalk | Manufacturer's/company safety manual |
| Pencils and scratch paper | Sample hazardous materials labels |
| Appropriate personal protective equipment | Sample MSDS |
| Seat belts | Safety can |
| Samples of common safety signs | Safety goggles |
| Samples of safety tags | Gloves |
| Lockout/tagout device | |

| | |
|---|---------------------------------|
| Respirator and cartridges | Dig Safely cards |
| Hard hat | Copies of the Trade Terms Quiz* |
| Hearing protection | Module Examinations** |
| Heavy equipment safety manuals | Performance Profile Sheets** |
| Heavy equipment operating and maintenance manuals | |

* Located in the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference works are suggested for both instructors and motivated trainees interested in further study. These are optional materials for continued education rather than for task training.

Construction Safety, 1996. Jimmie Hinze. Englewood Cliffs, NJ: Prentice Hall.

Construction Safety Council Home Page, <http://buildsafe.org/home.htm>.

Field Safety, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

Handbook of OSHA Construction Safety and Health, 1999. James V. Eidson et al. Boca Raton, FL: Lewis Publishers, Inc.

HazCom for Construction. Videocassette. 11 minutes. Coastal Training Technologies Corp. Virginia Beach VA.

Manual on Uniform Traffic Control Devices for Street and Highways. 2003 edition. Washington, DC: U.S. Department of transportation, Federal Highway Administration.

NAHB-OSHA Jobsite Safety Handbook, 1999. Washington, DC: Home Builder Press. Available online at www.osha.gov.

Occupational Safety and Health Standards for the Construction Industry, Washington, DC: Occupational Safety and Health Administration, U.S. Department of Labor, U.S. Government Printing Office.

Safety Orientation, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

Safety Technology, 2003. NCCER. Upper Saddle River, NJ: Prentice Hall.

United States Department of Labor, Occupational Safety and Health Administration Home Page, <http://www.osha.gov>.

Vehicles and Heavy Equipment Training Guide, the Electronic Library of Construction Occupational Health and Safety, www.cdc.gov.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Heavy Equipment Safety*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

| Topic | Planned Time |
|---|--------------|
| Session I. Introduction and Work Zone Safety | |
| A. Introduction | _____ |
| B. Work Zone Safety | _____ |
| C. Laboratory – Trainees practice placing barricades and temporary traffic control devices for a highway construction zone. This laboratory corresponds to Performance Task 2. | _____ |
| D. Laboratory – Trainees practice using flags or paddles to control traffic. This laboratory corresponds to Performance Task 3. | _____ |
| Session II. Hazard Communication | |
| A. Hazard Communication | _____ |
| 1. MSDS | _____ |
| 2. Personal Protective Equipment | _____ |
| B. Laboratory – Trainees practice putting on various types of personal protection equipment. This laboratory corresponds to Performance Task 1. | _____ |
| Session III. Heavy Equipment Safety | |
| A. Job-Site Safety | _____ |
| B. Equipment Safety | _____ |
| C. Personal Safety | _____ |
| D. Weather Hazards | _____ |
| E. Driving Safely | _____ |
| F. Transporting Equipment | _____ |
| G. Maintaining Equipment | _____ |
| Session IV. Trenching Safety, Personal Safety, Review, Module Examination, and Performance Testing | |
| A. Trenching Safety | _____ |
| B. Personal Safety | _____ |
| C. Review | _____ |
| D. Module Examination | _____ |
| 1. Trainees must score 70 percent or higher to receive recognition from NCCER. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |
| E. Performance Testing | _____ |
| 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |

MODULE OVERVIEW

This module introduces the ten most used pieces of heavy equipment, including dump trucks, backhoes, and bulldozers. It describes the functional operation and uses for each piece of equipment.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Heavy Equipment Operations Level One*, Modules 22101-05 and 22102-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the various heavy equipment used on a construction site.
2. State the primary use or uses of each equipment item.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Identify the various types of heavy equipment and their uses.
2. Identify the basic parts of each type of equipment and differences in models among the same type of equipment.
3. Point out the primary components of the vehicle drive system.
4. Point out the primary components of the hydraulic system.

MATERIALS AND EQUIPMENT LIST

| | |
|-------------------------------|--|
| Overhead projector and screen | Appropriate personal protective equipment |
| Transparencies | Various pieces of heavy equipment |
| Blank acetate sheets | Sales brochures from heavy equipment manufacturers |
| Transparency pens | Copies of the Trade Terms Quiz* |
| Whiteboard/chalkboard | Module Examinations** |
| Markers/chalk | Performance Profile Sheets** |
| Pencils and scratch paper | |

* Located in the back of the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference work is suggested for both instructors and motivated trainees interested in further study. This is optional material for continued education rather than for task training.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 5 hours are suggested to cover *Identification of Heavy Equipment*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

| Topic | Planned Time |
|--|--------------|
| Session I. Introduction, Types of Heavy Equipment, and Vehicle Drive System | |
| A. Introduction | _____ |
| B. Types of Heavy Equipment | _____ |
| C. Laboratory – Trainees practice identifying various types of heavy equipment and their uses, and identifying the basic parts of each type of equipment and the differences between models. This laboratory corresponds to Performance Tasks 1 and 2. | _____ |
| Session II. Vehicle Drive System, Hydraulic System, Review, Module Examination, and Performance Testing | |
| A. Vehicle Drive System | _____ |
| B. Laboratory – Trainees practice pointing out the primary components of the vehicle drive system. This laboratory corresponds to Performance Task 3. | _____ |
| C. Hydraulic System | _____ |
| D. Laboratory – Trainees practice pointing out the primary components of the hydraulic system. This laboratory corresponds to Performance Task 4. | _____ |
| E. Review | _____ |
| F. Module Examination | _____ |
| 1. Trainees must score 70 percent or higher to receive recognition from NCCER. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |
| G. Performance Testing | _____ |
| 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor | |

MODULE OVERVIEW

This module describes the most frequently used pieces of heavy equipment such as dump trucks, backhoes, and bulldozers. It describes the machines and their uses, the controls and instruments, prestart inspection procedures, operational movement, and safe shutdown.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Heavy Equipment Operations Level One*, Modules 22101-05 through 22103-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe the basic operational guidelines for heavy equipment.
2. Describe basic safety rules and some specific safety rules when operating heavy equipment.
3. Perform basic prestart inspection, startup, operational movement, and shutdown for heavy equipment under the guidance of an instructor.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Perform prestart inspection, startup, operational movement, and shutdown procedures for the following types of heavy equipment:
 - Construction tractors
 - Dozers
 - Loaders
 - Backhoes
 - Excavators
 - Roller compactors
 - Motor graders
 - Scrapers
 - Dump trucks
 - Forklifts
 - Skid steer loaders

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Appropriate personal protective equipment

Various pieces of heavy equipment

Sales brochures from heavy equipment manufacturers

Operating manuals for each piece of equipment

Copies of the Trade Terms Quiz*

Module Examinations**

Performance Profile Sheets**

* Located in the back of the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures. This module requires trainees to operate various heavy equipment. Ensure all trainees are briefed on machine safety procedures before operating equipment.

ADDITIONAL RESOURCES

This module is intended to present thorough resources for task training. The following reference work is suggested for both instructors and motivated trainees interested in further study. This is optional material for continued education rather than for task training.

The Earthmoving Encyclopedia, Latest Edition. St. Paul, MN: MBI Publishing.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Basic Operational Techniques*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

| Topic | Planned Time |
|--|--------------|
| Session I. Introduction, Basic Operation, and Construction Tractors | |
| A. Introduction | _____ |
| B. Basic Operation | _____ |
| 1. Prestart Inspection and Safety | _____ |
| 2. Startup and Warmup | _____ |
| 3. Shutdown Procedures | _____ |
| C. Construction Tractors | _____ |
| 1. Prestart Inspection and Safety | _____ |
| 2. Startup and Warmup | _____ |
| 3. Operational Controls | _____ |
| 4. Shutdown Procedures | _____ |
| D. Laboratory – Trainees practice inspecting, starting, operating, and shutting down construction tractors. This laboratory corresponds to Performance Task 1. | _____ |
| Session II. Dozers | |
| A. Dozers | _____ |
| 1. Prestart Inspection and Safety | _____ |
| 2. Startup and Warmup | _____ |
| 3. Operational Controls | _____ |
| 4. Shutdown Procedures | _____ |
| B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down dozers. This laboratory corresponds to Performance Task 1. | _____ |

Session III. Loaders

A. Loaders

- 1. Prestart Inspection and Safety
- 2. Startup and Warmup
- 3. Operational Controls
- 4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down loaders. This laboratory corresponds to Performance Task 1.

Session IV. Backhoes

A. Backhoes

- 1. Prestart Inspection and Safety
- 2. Startup and Warmup
- 3. Operational Controls
- 4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down backhoes. This laboratory corresponds to Performance Task 1.

Session V. Excavators

A. Excavators

- 1. Prestart Inspection and Safety
- 2. Startup and Warmup
- 3. Operational Controls
- 4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down excavators. This laboratory corresponds to Performance Task 1.

Session VI. Rollers and Compactors

A. Rollers and Compactors

- 1. Prestart Inspection and Safety
- 2. Startup and Warmup
- 3. Operational Controls
- 4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down rollers and compactors. This laboratory corresponds to Performance Task 1.

Session VII. Motor Graders and Scrapers

A. Motor Graders

- 1. Prestart Inspection and Safety
- 2. Startup and Warmup
- 3. Operational Controls
- 4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down motor graders. This laboratory corresponds to Performance Task 1.

C. Scrapers

1. Prestart Inspection and Safety
2. Startup and Warmup
3. Operational Controls
4. Shutdown Procedures

D. Laboratory – Trainees practice inspecting, starting, operating, and shutting down scrapers. This laboratory corresponds to Performance Task 1.

Session VIII. Dump Trucks

A. Dump Trucks

1. Prestart Inspection and Safety
2. Startup and Warmup
3. Operational Controls
4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down dump trucks. This laboratory corresponds to Performance Task 1.

Session IX. Forklifts and Skid Steer Loaders

A. Forklifts

1. Prestart Inspection and Safety
2. Startup and Warmup
3. Operational Controls
4. Shutdown Procedures

B. Laboratory – Trainees practice inspecting, starting, operating, and shutting down forklifts. This laboratory corresponds to Performance Task 1.

C. Skid Steer Loaders

1. Prestart Inspection and Safety
2. Startup and Warmup
3. Operational Controls
4. Shutdown Procedures

D. Laboratory – Trainees practice inspecting, starting, operating, and shutting down skid steer loaders. This laboratory corresponds to Performance Task 1.

Session X. Review, Module Examination, and Performance Testing

A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor

MODULE OVERVIEW

This module covers operation of general utility tractors in the construction industry. It describes duties and responsibilities of the operator, safety rules for operation, the attachment of implements, and basic preventive maintenance practices.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Heavy Equipment Operations Level One*, Modules 22101-05 through 22104-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify the operating controls of a typical tractor.
2. Describe the different types of transmission used on tractors.
3. State safety rules for operating tractors and hydraulic systems.
4. Describe the proper methods for operating a tractor on slopes or hills.
5. Explain the proper method for adjusting a drawbar.
6. Perform prestart inspection and maintenance procedures.
7. Start, warm up, and shut down a gasoline-powered and diesel-powered tractor engine.
8. Perform basic maneuvering with a tractor.
9. Attach an attachment to a drawbar, three-point hitch, or power takeoff.
10. Connect hydraulic-powered attachments to the tractor.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Perform prestart inspection and maintenance procedures.
2. Start, warm up, and shut down a tractor.
3. Perform basic maneuvering with a tractor.
4. Attach implements to a drawbar and three-point hitch.
5. Attach and detach implements to a power takeoff.

MATERIALS AND EQUIPMENT LIST

| | |
|--|--|
| Overhead projector and screen | Operator's manual for a construction tractor |
| Transparencies | AEM safety manual for construction tractors or other tractor safety manual |
| Blank acetate sheets | Tractor and attachments |
| Transparency pens | Tools |
| Whiteboard/chalkboard | Gloves and goggles |
| Markers/chalk | Copies of the Trade Terms Quiz* |
| Pencils and scratch paper | Module Examinations** |
| Appropriate personal protective equipment | Performance Profile Sheets** |
| Various pieces of heavy equipment | |
| Copies of manufacturers' literature on construction tractors | |

* Located in the back of the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures. This module requires trainees to operate heavy equipment. Ensure all trainees are briefed on machine safety procedures before operating equipment.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Tractors*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

| Topic | Planned Time |
|---|---------------------|
| Session I. Introduction and Identification of Equipment, and Safety Guidelines | |
| A. Introduction | _____ |
| B. Identification of Equipment | _____ |
| C. Safety Guidelines | _____ |
| Sessions II and III. Hitches, Attachments, Basic Preventive Maintenance, and Operation | |
| A. Hitches and Attachments | _____ |
| B. Basic Preventive Maintenance | _____ |
| C. Operation | _____ |
| 1. Prestart Inspection | _____ |
| 2. Startup and Warmup | _____ |
| 3. Basic Maneuvering | _____ |
| 4. Attaching Implements | _____ |
| 5. Shutdown Procedures | _____ |
| D. Laboratory – Trainees practice performing a prestart inspection on a construction tractor. This laboratory corresponds to Performance Task 1. | _____ |
| E. Laboratory – Trainees practice starting, operating, and shutting down a construction tractor. This laboratory corresponds to Performance Tasks 2 and 3. | _____ |
| F. Laboratory – Trainees practice attaching and detaching implements to a construction tractor. This laboratory corresponds to Performance Tasks 4 and 5. | _____ |
| Session IV. Review, Module Examination, and Performance Testing | |
| A. Review | _____ |
| B. Module Examination | _____ |
| 1. Trainees must score 70 percent or higher to receive recognition from NCCER. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |
| C. Performance Testing | _____ |
| 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor | |

MODULE OVERVIEW

This module introduces the concept of preparing graded surfaces using heavy equipment. It also covers identification of construction stakes and interpretation of marks on each type of stake and describes the process for grading slopes.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Heavy Equipment Operations Level One*, Modules 22101-05 through 22105-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Match terms associated with grade work to the correct definitions.
2. Match types of stakes to their correct usage, and explain markings on grade stakes and bench mark (BM) stakes.
3. Identify equipment used by the operator to check stakes.
4. State the meaning of slope ratio.
5. Distinguish between backslope and foreslope.
6. Check horizontal and vertical distance of cut and fill slope stakes.
7. Check finish subgrade on a cross slope.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Identify types of stakes and markings on stakes.
2. Check horizontal and vertical distance of cut and fill slope stakes.
3. Check finish subgrade on a cross slope.

MATERIALS AND EQUIPMENT LIST

| | |
|---|---------------------------------|
| Overhead projector and screen | Laser level |
| Transparencies | Electronic level |
| Blank acetate sheets | Finish grade stakes |
| Transparency pens | Hand level |
| Whiteboard/chalkboard | Level rod |
| Markers/chalk | Cloth or metal tape |
| Pencils and scratch paper | Screen |
| Appropriate personal protective equipment | 18" rules |
| Construction plans with topographical and grade information | Flagging |
| Variety of stakes, lath, hubs | Keel |
| Sight level | Black marker |
| Measuring tape | String |
| Builder's level | Copies of the Trade Terms Quiz* |
| Builder's level tripod | Module Examinations** |
| | Performance Profile Sheet** |

* Located in the back of the Trainee Module.

** Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety. This module may require trainees to visit job sites. Make sure that all trainees are briefed on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Grades, Part One*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

| Topic | Planned Time |
|---|--------------|
| Session I. Introduction, Planning Grades, and Site Layout | |
| A. Introduction | _____ |
| B. Planning Grades | _____ |
| C. Site Layout | _____ |
| D. Laboratory – Trainees practice identifying types of stakes and markings on stakes. This laboratory corresponds to Performance Task 1. | _____ |
| Sessions II and III. Performing Site Measurements and Finish Grades | |
| A. Performing Site Measurements | _____ |
| B. Laboratory – Trainees practice checking horizontal and vertical distance of cut and fill slope stakes. This laboratory corresponds to Performance Task 2. | _____ |
| C. Finish Grades | _____ |
| D. Laboratory – Trainees practice checking finish subgrade on a cross slope. This laboratory corresponds to Performance Task 3. | _____ |
| Session IV. Review, Module Examination, and Performance Testing | |
| A. Module Review | _____ |
| B. Module Examination | _____ |
| 1. Trainees must score 70 percent or higher to receive recognition from NCCER. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor. | |
| C. Performance Testing | _____ |
| 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements. | |
| 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor | |