Module 31101-15 introduces the scaffolding trade and its associated trade math, regulations, and standards; identifies commonly used scaffolding systems and their safety systems; and addresses personal qualities and the apprenticeship training process.

**Objectives**

**Learning Objective 1**
- Explain the scaffolding trade and the trade math and regulations and standards associated with the scaffolding trade.
  a. Describe the scaffolding trade.
  b. Summarize the math applications used in the scaffolding trade.
  c. Identify the regulatory agencies in the scaffolding trade and their basic standards.

**Learning Objective 2**
- Identify commonly used scaffold systems and the safety guidelines associated with each type of system.
  a. Identify the safety guidelines, characteristics, and applications of supported scaffold systems.
  b. Identify the safety guidelines, characteristics, and applications of mobile scaffold systems.
  c. Identify the safety guidelines, characteristics, and applications of suspension scaffold systems.

**Learning Objective 3**
- Identify personal qualities that contribute to job success.
  a. Describe the responsibilities of a scaffold builder.
  b. Describe the attributes of a good scaffold builder.

**Learning Objective 4**
- Explain the apprenticeship training process.
  a. Describe the types of formal craft training available in the scaffolding industry.
  b. Describe the standards associated with an apprenticeship program.
  c. Identify the functions of the Bureau of Apprenticeship and Training (BAT).
  d. Identify the advantages and benefits of today’s apprenticeship training programs.

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

**Teaching Time: 7.5 hours**
(Three 2.5-hour Classroom sessions)
Session time 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 Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Classroom Equipment and Materials**
- Pencils and paper
- Whiteboard/chalkboard
- Markers/chalk
- **Scaffolding PowerPoint®** Presentation Slides
- Copies of the Module Examination
- Computer
- TV/DVD player
- Vendor-supplied videos/DVDs showing supported, mobile, and suspension scaffold systems *(optional)*

**Equipment and Materials for Laboratories and Performance Testing**
- Copies of Section 5 of the Williams-Steiger Occupational Safety and Health Act of 1970 *(the “general-duty clause”)*
- Copies of sections of the latest edition of OSHA **Safety and Health Standards for the Construction Industry** that address scaffold safety
- Copies of the section of the local applicable building code that addresses design and use of scaffolds
- Photographs or manufacturers’ illustrations of tubular welded-frame systems, tube-and-clamp systems, outrigger systems, pump-jack systems, mobile scaffolds, scissors lifts, aerial lifts, mast-climbing platforms, swinging scaffolds, boatswain’s chairs, work cages, beam-suspended scaffolds, multiple-point suspension scaffolds, catenary scaffolds, and float scaffolds

**Additional Resources and References**
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on the scaffolding trade, commonly used scaffolding systems, and the apprenticeship training process. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

### Session One

Session One introduces the scaffolding trade, scaffold systems, and safety guidelines.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the scaffolding trade.
3. Introduce trainees to scaffold systems and safety guidelines.

### Session Two

Session Two introduces the responsibilities and characteristics of scaffold builders, and the apprenticeship training process.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the responsibilities and attributes of a scaffold builder.
3. Introduce trainees to the formal craft training process and its associated standards.

### Session Three

Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Personal protective equipment:

- Copies of Section 5 of the Williams-Steiger Occupational Safety and Health Act of 1970 (the “general-duty clause”)
- Copies of the section of the local applicable building code that addresses design and use of scaffolds
- Photographs or manufacturers’ illustrations of tubular welded-frame systems, tube-and-clamp systems, outrigger systems, pump-jack systems, mobile scaffolds, scissors lifts, aerial lifts, mast-climbing platforms, swinging scaffolds, boatswain’s chairs, work cages, beam-suspended scaffolds, multiple-point suspension scaffolds, catenary scaffolds, and float scaffolds

### Equipment and Materials

<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### None

- Copies of sections of the latest edition of OSHA Safety and Health Standards for the Construction Industry that address scaffold safety

- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- **Scaffolding PowerPoint® Presentation Slides**
- DVD player
- Computer
- Copies of the Module Examination
- Vendor-supplied videos/DVDs showing supported, mobile, and suspension scaffold systems *(optional)*

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.
Module 31102-15 provides a comprehensive overview of the safety regulations and standards for the scaffolding industry.

Objectives

Learning Objective 1
• Identify the reasons for the Occupational Safety and Health Act (OSHA) regulations that govern the scaffolding industry.
  a. Explain the development and intent of the regulations and standards.
  b. Describe common safety practices used in the scaffolding industry.

Learning Objective 2
• Explain the basic guidelines for planning, erecting, and using scaffolding.
  a. Explain the basic guidelines for planning a scaffolding project.
  b. Explain the basic guidelines for erecting a scaffold.
  c. Explain the basic guidelines for using a scaffold.

Learning Objective 3
• Identify the equipment and tasks required for safe scaffold erection.
  a. List the personal protective equipment required for safe scaffold erection.

Learning Objective 4
• Identify the fall protection and lifesaving measures employed in the scaffolding trade.
  a. Identify the appropriate fall protection and lifesaving equipment, and describe their proper use.
  b. Describe proper rescue procedures after a fall.

Learning Objective 5
• Identify common electrical hazards and sources when working with scaffolds.
  a. Identify common electrical hazards when working with scaffolds.
  b. Identify common electrical sources when working with scaffolds.

Performance Tasks

Performance Task 1
(Learning Objective 1)
• Inspect the work site and identify potential safety hazards.

Performance Task 2
(Learning Objective 2)
• Plan and sketch a scaffold for a specific application specified by the instructor.

Performance Task 3
(Learning Objective 2)
• Examine and identify the soil type at the work site, and determine the proper mudsills to use.

Performance Task 4
(Learning Objective 4)
• Demonstrate the proper method for wearing and rigging a body harness.

Teaching Time: 7.5 hours
(Three 2.5-hour Classroom sessions)
Session time 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 Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations
This module requires that trainees inspect a work site to identify potential safety hazards. Safety is paramount in the scaffolding trade, and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials
Pencils and paper
Whiteboard/chalkboard
Markers/chalk
Scaffolding PowerPoint®
Presentation Slides
Copies of the Module Examination and Performance Profile Sheets
Computer
TV/DVD player
Vendor-supplied videos/DVDs showing scaffolding-related safety hazards on a construction site (optional)

Equipment and Materials for Laboratories and Performance Testing
Appropriate PPE:
  - Eye protection
  - Gloves
  - Hard hat
  - Hearing protection
  - Respiratory protection
  - Safety shoes
Assortment of equipment used in personal fall arrest systems including body harnesses, lanyards, deceleration devices, lifelines, anchoring devices, equipment connectors, and safety nets
Assortment of personal protective equipment (PPE) commonly used by scaffold builders including foot protection, hand protection, eye and face protection, head protection, and hearing protection
Copies of an employee safety manual from a company that builds scaffolding

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on scaffolding safety. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces safety regulations and standards and covers the proper planning, erecting, and use of scaffolding.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the development and intent of regulations and standards.
3. Introduce trainees to safety and health provisions, training, definitions, and common practices.

**SESSION TWO**

Session Two introduces safe scaffold erection techniques, fall protection and lifesaving equipment, and potential electrical hazards and sources.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the appropriate personal protective equipment used in scaffold erection, including foot, hand, eye, face, head, hearing, and respiratory protection.
3. Introduce trainees to the fall protection and lifesaving equipment and procedures used in scaffold erection.
4. Introduce trainees to the potential electrical hazards and sources likely to be encountered on a construction site.

**SESSION THREE**

Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Equipment and Materials

<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Assortment of equipment used in personal fall arrest systems including body harnesses, lanyards, deceleration devices, lifelines, anchoring devices, equipment connectors, and safety nets</th>
<th>Assortment of personal protective equipment (PPE) commonly used by scaffold builders including foot protection, hand protection, eye and face protection, head protection, and hearing protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye protection</td>
<td>Copies of an employee safety manual from a company that builds scaffolding</td>
<td>Copies of scaffolding manufacturers’ manuals</td>
</tr>
<tr>
<td>Gloves</td>
<td>Copies of Section 22 in the latest edition of Army Corps of Engineers Manual No. 385-1-1, <em>Safety and Health Requirements</em></td>
<td>Photos of platforms equipped with various safety features such as toeboards, guardrails, and sway prevention</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Sections of damaged or deformed scaffolding</td>
<td>Stations with an assortment of soil types</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Stations set up with materials, equipment, or photos that represent potential safety hazards on a work site</td>
<td>Variety of approved devices for hearing protection</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Safety shoes</td>
<td></td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Markers/chalk</td>
<td></td>
</tr>
<tr>
<td>Pencils and paper</td>
<td><em>Scaffolding PowerPoint® Presentation Slides</em></td>
<td></td>
</tr>
<tr>
<td>DVD player</td>
<td>Computer</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Vendor-supplied videos/DVDs showing scaffolding-related safety hazards on a construction site (optional)</td>
<td></td>
</tr>
</tbody>
</table>

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.
Module 31103-15 describes the safe use and applications of hand and power tools, manual lifting tools, and fall restraint and arrest equipment used in the scaffolding industry.

**Objectives**

**Learning Objective 1**
- Explain the proper methods of storing, handling, and inspecting scaffold equipment.
  a. Explain the proper methods for storing scaffold equipment at the laydown area.
  b. Explain the proper methods for handling scaffold equipment.
  c. Explain the general inspection procedures for equipment of various types of scaffold systems.
  d. Explain the procedures for the repair of damaged equipment.

**Learning Objective 2**
- Identify the hand and power tools commonly used by scaffold builders, and describe their proper use.
  a. Identify the hand tools commonly used by scaffold builders, and describe their proper use.
  b. Identify the power tools commonly used by scaffold builders, and describe their proper use.

**Learning Objective 3**
- Identify the components used to level scaffolds, and how to properly use these items.
  a. Describe the purpose and proper use of screw jacks.
  b. Describe the general guidelines for properly using jacks.

**Learning Objective 4**
- Describe the proper use of personal fall arrest equipment used in the scaffolding industry.
  a. Describe the proper use of vertical and horizontal lifeline systems.
  b. Describe the proper use of self-retracting fall arrest lifeline devices.

**Performance Tasks**

**Performance Task 1 (Learning Objective 1)**
- Perform inspection of available scaffold equipment.

**Performance Task 2 (Learning Objective 2)**
- Demonstrate the safe and effective use of available hand tools.

**Performance Task 3 (Learning Objective 2)**
- Demonstrate the safe and effective use of power tools.

**Performance Task 4 (Learning Objective 4)**
- Demonstrate the proper rigging of available fall arrest devices.

**Teaching Time: 7.5 hours**
(Three 2.5-hour Classroom sessions)
Session time 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 Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**

This module requires that trainees work with hand and power tools. Safety is paramount in the scaffolding trade, and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

### Classroom Equipment and Materials
- Pencils and paper
- Whiteboard/chalkboard
- Markers/chalk
- Scaffold PowerPoint® Presentation Slides
- Copies of the Module Examination and Performance Profile Sheets
- Computer
- TV/DVD player
- Vendor-supplied videos/DVDs showing the safe use of hand and power tools, manual lifting tools, and fall restraint and arrest equipment *(optional)*

### Equipment and Materials for Laboratories and Performance Testing
- **Appropriate PPE:**
  - Eye protection
  - Gloves
  - Hard hat
  - Hearing protection
  - Respiratory protection
  - Safety shoes
- Assortment of scaffolds (or photos) with various types of damage that can be detected by visual inspection
- Copies of manufacturers’ instructions for a variety of power tools used by scaffold builders
- Copies of manufacturers’ instructions for upright and inverted screw jacks
- Flashlight
- Inverted jack
- Section of scaffold tube
- Spirit level
- Torpedo level
- Upright jack
- Stations with a variety of hand tools used by scaffold builders, including:
  - Banders
  - Crow bars and nail pullers
  - Hammers
  - Handsaws
  - Levels
  - Lineman’s pliers
  - Plumb bobs
  - Rules and tapes
  - Snips and shears
  - String line
  - Wrenches
- Stations with a variety of power tools used by scaffold builders, including:
  - Circular saws
  - Reciprocating saws
  - Saber/jig saws
- Stations with a variety of scaffold equipment (including some items with damage), such as:
  - Caster brakes and swivels
  - Cross braces and brace locks
  - Lumber
  - Rivets and bolts
  - Tube

### Additional Resources and References

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


There are a number of online resources available for trainees who would like more information on the tools and equipment used by scaffold builders. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**
Session One introduces the proper methods for storing, handling, and inspecting scaffold equipment, and the tools used by scaffold builders.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the techniques used for storing and handling scaffold equipment.
3. Introduce trainees to the techniques used for inspecting and repairing scaffold equipment.
4. Introduce trainees to the types and uses of hand and power tools used by scaffold builders.

**SESSION TWO**
Session Two introduces scaffold lifting components and lifeline devices used by scaffold builders.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the types and applications of jacks.
3. Introduce trainees to the proper use of lifeline systems.

**SESSION THREE**
Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 31103-15, Trade Tools and Equipment

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td></td>
</tr>
<tr>
<td>Assortment of scaffolds (or photos) with various types of damage that can be detected by visual inspection</td>
<td>Copies of manufacturers’ instructions for a variety of power tools used by scaffold builders</td>
</tr>
<tr>
<td>Eye protection</td>
<td></td>
</tr>
<tr>
<td>Copies of manufacturers’ instructions for upright and inverted screw jacks</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Flashlight</td>
<td>Inverted jack</td>
</tr>
<tr>
<td>Hard hat</td>
<td></td>
</tr>
<tr>
<td>Section of scaffold tube</td>
<td>Spirit level</td>
</tr>
<tr>
<td>Hearing protection</td>
<td></td>
</tr>
<tr>
<td>Torpedo level</td>
<td>Upright jack</td>
</tr>
<tr>
<td><strong>Respiratory protection</strong></td>
<td></td>
</tr>
<tr>
<td>Stations with a variety of hand tools used by scaffold builders, including: Banders Crow bars and nail pullers Hammers Handsaws Levels Lineman’s pliers Plumb bobs Rules and tapes Snips and shears String line Wrenches</td>
<td>Stations with a variety of scaffold equipment (including some items with damage), such as: Caster brakes and swivels Cross braces and brace locks Lumber Rivets and bolts Tube</td>
</tr>
<tr>
<td>Safety shoes</td>
<td></td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td></td>
</tr>
<tr>
<td>Markers/chalk</td>
<td></td>
</tr>
<tr>
<td>Pencils and paper</td>
<td></td>
</tr>
<tr>
<td><strong>Scaffolding PowerPoint® Presentation Slides</strong></td>
<td></td>
</tr>
<tr>
<td>DVD player</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td></td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing the safe use of hand and power tools, manual lifting tools, and fall restraint and arrest equipment (optional)</td>
<td></td>
</tr>
</tbody>
</table>

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.
Module 31104-15 explains and demonstrates how to perform math calculations of scaffold loads, including area loads, concentrated loads, live loads, cantilevered loads, and wind loads.

Objectives

Learning Objective 1
- Explain how to calculate the area and linear dimensions of plane surfaces.
  a. Explain how to calculate the area of rectangles and circles.
  b. Explain how to calculate the perimeter or linear dimensions of structures.

Learning Objective 2
- Explain how to reference and use tables commonly used in the scaffolding trade to solve math problems.
  a. Explain how to reference and use comparative value tables.
  b. Explain how to reference and use mathematical tables.

Learning Objective 3
- Identify types of live and dead loads on scaffolds and explain how to calculate these loads.
  a. Identify common types of live and dead loads.
  b. Explain how to calculate equipment loads.
  c. Explain how to calculate human loads.
  d. Explain how to calculate material loads.

Learning Objective 4
- Explain how to calculate loads as to their placement on scaffold platforms.
  a. Explain how to calculate concentrated loads.
  b. Explain how to calculate distributed loads.
  c. Explain how to calculate cantilevered loads.

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

Teaching Time: 7.5 hours
(Three 2.5-hour Classroom sessions)
Session time 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 Module Examinations and Performance Profile Sheets from www.ncerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**
This module does not include Performance Tasks that require safety considerations or personal protective equipment. However, safety is paramount in the scaffolding trade, and safe habits and practices must be emphasized whenever possible.

**Classroom Equipment and Materials**
- Pencils and paper
- Whiteboard/chalkboard
- Markers/chalk
- **Scaffolding PowerPoint®** Presentation Slides
- Copies of the Module Examination
- Computer
- TV/DVD player
- Vendor-supplied videos/DVDs showing techniques for calculating dimensions and loads in scaffold construction (optional)

**Equipment and Materials for Laboratories and Performance Testing**
No lab equipment is required for this module.

**Additional Resources and References**
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on math calculations used in the scaffolding trade. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces techniques for calculating the area of plane surfaces and using tables to solve common math problems.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the process of calculating the area and perimeter of plane surfaces.
3. Introduce trainees to the use of comparative value and mathematical tables for solving math problems.

**SESSION TWO**

Session Two introduces techniques for calculating various types of loads on scaffolds.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the types of live and dead loads and how to calculate them.
3. Introduce trainees to the techniques used to calculate load placement on scaffolds.

**SESSION THREE**

Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
Materials Checklist for Module 31104-15, Trade Math

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal protective equipment:</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Markers/chalk</td>
</tr>
<tr>
<td>Pencils and paper</td>
</tr>
<tr>
<td><em>Scaffolding</em> PowerPoint® Presentation Slides</td>
</tr>
<tr>
<td>DVD player</td>
</tr>
<tr>
<td>Computer</td>
</tr>
<tr>
<td>Copies of the Module Examination</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing techniques for calculating dimensions and loads in scaffold construction (optional)</td>
</tr>
</tbody>
</table>

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.
Lesson Plans for Module 31105-15

SUPPORTED SCAFFOLDS

Module 31105-15 describes the equipment used with supported scaffolds and the procedures for erecting them.

Objectives

Learning Objective 1
- Describe the safety considerations regarding supported scaffolds.
  a. Identify safety regulations for various types of supported scaffold systems.

Learning Objective 2
- Explain the basic principles of system scaffolds, and outline proper erection procedures.
  a. Explain the versatility of system scaffold components.
  b. Describe various system scaffold configurations.
  c. Outline the steps for proper erection of a system scaffold.

Learning Objective 3
- Explain the basic principles of tubular welded-frame scaffolds, and outline proper erection procedures.
  a. Identify common applications of tubular welded-frame scaffolds.
  b. Identify the components of tubular welded-frame scaffolds.
  c. Outline the steps for proper erection of a tubular welded-frame scaffold.

Learning Objective 4
- Explain the basic principles of tube-and-clamp scaffolds, and outline proper erection procedures.
  a. Identify common applications of tube-and-clamp scaffolds.
  b. Identify the components of tube-and-clamp scaffolds.
  c. Outline the steps for proper erection of a tube-and-clamp scaffold.

Learning Objective 5
- Identify other supported scaffold systems.
  a. Explain the basic principles of outrigger scaffolds, and outline proper erection procedures.
  b. Explain the basic principles of pump-jack scaffolds, and outline proper erection procedures.

Performance Tasks

Performance Task 1 (Learning Objective 4)
- Safely erect a section of two of the following types of scaffolds:
  - System scaffold
  - Tubular welded-frame scaffold
  - Tube-and-clamp scaffold

Teaching Time: 32.5 hours
(Thirteen 2.5-hour Classroom sessions)
Session time 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 Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations

This module requires that trainees erect and use supported scaffolds. Safety is paramount in the scaffolding trade, and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required personal protective equipment and follow safe tool practices and procedures.

Classroom Equipment and Materials

Pencils and paper
Whiteboard/chalkboard
Markers/chalk
Scaffolding PowerPoint® Presentation Slides
Copies of the Module Examination and Performance Profile Sheets
Computer
TV/DVD player
Vendor-supplied videos/DVDs showing the safe erection and use of supported scaffolds (optional)

Equipment and Materials for Laboratories and Performance Testing

Appropriate PPE:
- Eye protection
- Gloves
- Hard hat
- Hearing protection
- Respiratory protection
- Safety shoes
- A variety of connectors
- Copies of manufacturers’ instructions for several different brands of system scaffolds
- Copies of sections of the latest edition of the OSHA Safety and Health Standards for the Construction Industry that address scaffold safety
- Lengths of steel and aluminum tube scaffold legs
- Manufacturers’ instructions for tubular welded-frame scaffolds
- Stations with the tools, materials, and equipment required to erect system scaffolds, including:
  - Access gate panel with connector pins
  - Base plates
  - Casters with bolts or pins
  - Clamp-on ladder
  - Connector pins with locking pins
  - Cross brace
  - Guardrail posts with connector pins
  - Guardrails
  - Hammer
  - Horizontal diagonal brace
  - Mudsills
  - Scaffold deck
  - Scaffold frames
  - Screw jacks with sockets
  - Tape measure
  - Torpedo level

Stations with the tools, materials, and equipment required to erect tube-and-clamp scaffolds, including:
- Access gates
- Base plates
- Beam clamps
- Hooks
- Ladders
- Mudsills
- Planks and decks
- Right-angle clamps
- Stairs
- Swivel clamps
- Tubing
- Twist-lock fittings

Stations with the tools, materials, and equipment required to erect tubular welded-frame scaffolds, including:
- Base plates
- Braces
- Casters
- Coupling pins
- Drop locks
- Frames
- Gates
- Guardrails
- Hammer
- Horizontal bearers
- Horizontal cross braces
- Intermediate members
- Ladders
- Locking devices
- Planks and decks
- Platforms
- Putlogs
- Screw jacks
- Stairs
- Tape measure
- Ties
- Torpedo level
- Vertical cross braces
Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on supported scaffolds. A search for additional information may be assigned as homework to interested trainees.
SUPPORTED SCAFFOLDS

The lesson plan for this module is divided into thirteen 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSIONS ONE AND TWO**

Sessions One and Two introduce the safety regulations and guidelines that should be observed when erecting and using supported scaffolds.

1. Show Sessions One and Two PowerPoint® presentation slides.
2. Introduce trainees to the safety regulations and guidelines that apply to all supported scaffolds.
3. Introduce the safety regulations and guidelines that apply to specific types of supported scaffolds.

**SESSIONS THREE AND FOUR**

Sessions Three and Four introduce the applications, components, and erection process of system scaffolds.

1. Show Sessions Three and Four PowerPoint® presentation slides.
2. Introduce common applications and components of system scaffolds.
3. Discuss the steps involved in erecting system scaffolds.

**SESSIONS FIVE THROUGH SEVEN**

Sessions Five through Seven introduce the applications, components, and erection process of tubular welded-frame scaffolds.

1. Show Sessions Five through Seven PowerPoint® presentation slides.
2. Introduce common applications and components of tubular welded-frame scaffolds.
3. Discuss the steps involved in erecting tubular welded-frame scaffolds.

**SESSIONS EIGHT THROUGH TEN**

Sessions Eight through Ten introduce the applications, components, and erection process of tube-and-clamp scaffolds.

1. Show Sessions Eight through Ten PowerPoint® presentation slides.
2. Introduce common applications and components of tube-and-clamp scaffolds.
3. Discuss the steps involved in erecting tube-and-clamp scaffolds.

**SESSIONS ELEVEN AND TWELVE**

Sessions Eleven and Twelve introduce the applications, components, and erection process of other types of scaffold systems.

1. Show Sessions Eleven and Twelve PowerPoint® presentation slides.
2. Introduce common applications and components of other types of scaffold systems.
3. Discuss the steps involved in erecting other types of scaffold systems.

**SESSION THIRTEEN**

Session Thirteen is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Twelve.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td>A variety of connectors</td>
<td>Manufacturers’ instructions for tubular welded-frame scaffolds</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Lengths of steel and aluminum tube scaffold legs</td>
<td>Copies of manufacturers’ instructions for several different brands of system scaffolds</td>
</tr>
<tr>
<td>Gloves</td>
<td>Stations with the tools, materials, and equipment required to erect tubular welded-frame scaffolds, including:</td>
<td>Stations with the tools, materials, and equipment required to erect system scaffolds, including:</td>
</tr>
<tr>
<td></td>
<td>Base plates</td>
<td>Access gate panel with connector pins</td>
</tr>
<tr>
<td></td>
<td>Braces</td>
<td>Base plates</td>
</tr>
<tr>
<td></td>
<td>Casters</td>
<td>Casters with bolts or pins</td>
</tr>
<tr>
<td></td>
<td>Coupling pins</td>
<td>Clamp-on ladder</td>
</tr>
<tr>
<td></td>
<td>Drop locks</td>
<td>Connector pins with locking pins</td>
</tr>
<tr>
<td></td>
<td>Frames</td>
<td>Cross brace</td>
</tr>
<tr>
<td></td>
<td>Gates</td>
<td>Guardrail posts with connector pins</td>
</tr>
<tr>
<td></td>
<td>Guardrails</td>
<td>Guardrails</td>
</tr>
<tr>
<td></td>
<td>Hammer</td>
<td>Hammer</td>
</tr>
<tr>
<td></td>
<td>Horizontal bearers</td>
<td>Horizontal diagonal brace</td>
</tr>
<tr>
<td></td>
<td>Horizontal cross braces</td>
<td>Mudsills</td>
</tr>
<tr>
<td></td>
<td>Intermediate members</td>
<td>Scaffold deck</td>
</tr>
<tr>
<td></td>
<td>Ladders</td>
<td>Scaffold frames</td>
</tr>
<tr>
<td></td>
<td>Locking devices</td>
<td>Screw jacks with sockets</td>
</tr>
<tr>
<td></td>
<td>Planks and decks</td>
<td>Screw jacks</td>
</tr>
<tr>
<td></td>
<td>Platforms</td>
<td>Vertical cross braces</td>
</tr>
<tr>
<td></td>
<td>Planks and decks</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Platforms</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Screw jacks</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Stairs</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Tape measure</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Torpedo level</td>
<td>Twist-lock fittings</td>
</tr>
<tr>
<td></td>
<td>Vertical cross braces</td>
<td>Twist-lock fittings</td>
</tr>
</tbody>
</table>

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.
Module 31106-15 describes the different types of powered and manually propelled mobile scaffolds and describes their erection and operation.

### Objectives

**Learning Objective 1**
- Describe the operation and common applications of mobile scaffolds.
  - Outline proper safety guidelines when using mobile scaffolds.
  - Describe the benefits of mobile scaffolds.
  - Identify common mobile scaffold applications.
  - Identify mobile scaffold components.
  - Outline proper mobile scaffold erection.

**Learning Objective 2**
- Describe the proper operation of scissors lifts.
  - Explain the proper use of controls and indicators on scissors lifts.
  - Describe basic operating procedures and concerns when using scissors lifts.

**Learning Objective 3**
- Describe the operation and common applications of aerial lifts.
  - Outline proper safety standards when using aerial lifts.
  - Identify common aerial lift applications.

### Performance Tasks

**Performance Task 1**
**(Learning Objective 1)**
- Erect and use mobile scaffolds.

---

### Teaching Time: 10 hours

(Four 2.5-hour Classroom sessions)

Session time 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 Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Classroom Equipment and Materials
- Pencils and paper
- Whiteboard/chalkboard
- Markers/chalk
- Scaffolding PowerPoint® Presentation Slides
- Copies of the Module Examination and Performance Profile Sheets
- Computer
- TV/DVD player
- Vendor-supplied videos/DVDs showing safe erection and use of mobile scaffolds (optional)

Equipment and Materials for Laboratories and Performance Testing
- Appropriate PPE:
  - Eye protection
  - Gloves
  - Hard hat
  - Hearing protection
  - Respiratory protection
  - Safety shoes
- Assortment of braces and locks used in mobile scaffolds
- Copies of the operator’s manual for a scissors lift
- Copies of the operator’s manual for an aerial lift
- Copies of the section of the local applicable building code that addresses design and use of scaffolds
- Copies of the training manual or procedures for obtaining aerial lift operator qualifications
- Copies of the training manual or procedures for obtaining scissors lift operator qualifications
- Stations with tools, materials, and equipment required to erect mobile scaffolds, including:
  - Access gate panel with connector pins
  - Casters with bolts or pins
  - Clamp-on ladder
  - Connector pins with locking pins
  - Cross brace
  - Guardrail posts with connector pins
  - Guardrails
  - Hammer
  - Horizontal diagonal brace
  - Scaffold deck
  - Scaffold frames
  - Screw jack with socket
  - Tape measure
  - Toeboards
  - Torpedo level

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on mobile scaffolds. A search for additional information may be assigned as homework to interested trainees.
# Mobile Scaffolds

The lesson plan for this module is divided into four 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

## Session Outline for 31106-14

### Session One
Session One introduces the safety considerations, applications, and components of mobile scaffolds.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the safety guidelines that should be followed when working with mobile scaffolds.
3. Introduce trainees to common applications and components of mobile scaffolds.

### Session Two
Session Two introduces the safety considerations, applications, and components of scissors lifts.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the safety guidelines that should be followed when working with scissors lifts.
3. Introduce trainees to common applications and components of scissors lifts.

### Session Three
Session Three introduces the safety considerations, applications, and components of aerial lifts.

1. Show Session Three PowerPoint® presentation slides.
2. Introduce trainees to the safety guidelines that should be followed when working with aerial lifts.
3. Introduce trainees to common applications and components of aerial lifts.

### Session Four
Session Four is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Three.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Materials Checklist for Module 31106-15, Mobile Scaffolds

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Assortment of braces and locks used in mobile scaffolds</th>
<th>Copies of the operator’s manual for a scissors lift</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye protection</td>
<td>Copies of the section of the local applicable building code that addresses design and use of scaffolds</td>
<td>Copies of the operator’s manual for an aerial lift</td>
</tr>
<tr>
<td>Gloves</td>
<td>Copies of the training manual or procedures for obtaining scissors lift operator qualifications</td>
<td>Stations with tools, materials, and equipment required to erect mobile scaffolds, including:</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Copies of the training manual or procedures for obtaining aerial lift operator qualifications</td>
<td>Access gate panel with connector pins</td>
</tr>
<tr>
<td>Hearing protection</td>
<td></td>
<td>Casters with bolts or pins</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td></td>
<td>Clamp-on ladder</td>
</tr>
<tr>
<td>Safety shoes</td>
<td></td>
<td>Connector pins with locking pins</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td></td>
<td>Cross brace</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td></td>
<td>Guardrail posts with connector pins</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td></td>
<td>Guardrails</td>
</tr>
<tr>
<td>Scaffold PowerPoint® Presentation Slides</td>
<td></td>
<td>Hammer</td>
</tr>
<tr>
<td>DVD player</td>
<td></td>
<td>Horizontal diagonal brace</td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td>Scaffold deck</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td></td>
<td>Scaffold frames</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing safe erection and use of mobile scaffolds <em>(optional)</em></td>
<td></td>
<td>Screw jack with socket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tape measure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toeboards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Torpedo level</td>
</tr>
</tbody>
</table>

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.
Module 31107-15 describes the types of equipment used with suspension scaffolds and describes the rigging of suspension scaffolds.

### Objectives

#### Learning Objective 1
- Describe the safety considerations, applications, and components of suspension scaffolds.
  - a. Outline proper safety guidelines for suspension scaffolds.
  - b. Identify common suspension-scaffold applications.
  - c. Identify suspension-scaffold components.

#### Learning Objective 2
- Explain the proper methods for rigging suspension scaffolds.
  - a. Explain the proper methods for rigging boatswain's chairs, work cages, and beam-suspended scaffolds.

### Performance Tasks

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

### Teaching Time: 7.5 hours

(Three 2.5-hour Classroom sessions)

Session time 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 Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**
This module requires that trainees rig suspension scaffolds. Safety is paramount in the scaffolding trade, and safe habits and practices must be emphasized whenever possible. Each trainee must use required personal protective equipment and follow safe tool practices and procedures.

**Classroom Equipment and Materials**
- Pencils and paper
- Whiteboard/chalkboard
- Markers/chalk
- Scaffolding PowerPoint® Presentation Slides
- Copies of the Module Examination
- Computer
- TV/DVD player
- Vendor-supplied videos/DVDs showing how to safely rig suspension scaffolds *(optional)*

**Equipment and Materials for Laboratories and Performance Testing**
- Appropriate PPE:
  - Eye protection
  - Gloves
  - Hard hat
  - Hearing protection
  - Respiratory protection
  - Safety shoes
  - Assortment of cornice hooks and parapet clamps
  - Assortment of steel hangers
- Copies of manufacturers’ instructions for a variety of boatswain’s chairs
- Copies of manufacturers’ instructions for a variety of electric and compressed-air scaffold hoist mechanisms
- Copies of the section of the local applicable building code that addresses design and use of suspension scaffolds
- Personal fall arrest systems

**Additional Resources and References**
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on how to safely rig suspension scaffolds. A search for additional information may be assigned as homework to interested trainees.
The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**Session One**
Session One introduces the safety considerations, applications, and components of suspension scaffolds.

1. Show Session One PowerPoint® presentation slides.
2. Introduce trainees to the safety guidelines that should be followed when working with suspension scaffolds.
3. Introduce trainees to common applications and components of suspension scaffolds.

**Session Two**
Session Two introduces the proper methods for rigging suspension scaffolds.

1. Show Session Two PowerPoint® presentation slides.
2. Introduce trainees to the techniques used to rig boatswain’s chairs, work cages, and beam-suspended scaffolds.

**Session Three**
Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Materials Checklist for Module 31107-15, Suspension Scaffolds

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
</tr>
<tr>
<td>Assortment of cornice hooks and parapet clamps</td>
</tr>
<tr>
<td>Assortment of steel hangers</td>
</tr>
<tr>
<td>Copies of manufacturers’ instructions for a variety of</td>
</tr>
<tr>
<td>boatswain’s chairs</td>
</tr>
<tr>
<td>Copies of manufacturers’ instructions for a variety of</td>
</tr>
<tr>
<td>electric and compressed-air scaffold hoist mechanisms</td>
</tr>
<tr>
<td>Copies of the section of the local applicable building code</td>
</tr>
<tr>
<td>that addresses design and use of suspension scaffolds</td>
</tr>
<tr>
<td>Personal fall arrest systems</td>
</tr>
<tr>
<td>Hard hat</td>
</tr>
<tr>
<td>Hearing protection</td>
</tr>
<tr>
<td>Respiratory protection</td>
</tr>
<tr>
<td>Safety shoes</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Markers/chalk</td>
</tr>
<tr>
<td>Pencils and paper</td>
</tr>
<tr>
<td><strong>Scaffolding PowerPoint®</strong></td>
</tr>
<tr>
<td>Presentation Slides</td>
</tr>
<tr>
<td>DVD player</td>
</tr>
<tr>
<td>Computer</td>
</tr>
<tr>
<td>Copies of the Module Examination</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing how to safely rig</td>
</tr>
<tr>
<td>suspension scaffolds (optional)</td>
</tr>
</tbody>
</table>

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.