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IDENTIFIERS *Ohio Competency Analysis Profiles

ABSTRACT

This competency analysis profile lists 155 competencies that have been identified by employers as core competencies for inclusion in programs to train forest industry and resource conservation workers. The core competencies are organized into 10 units dealing the following: general safety precautions, natural resource industry operations, soil conservation, equipment maintenance, equipment operation, facility construction and maintenance, business management, employability skills, the forest industry, and resource conservation. Unit 8 (employability skills) has been further divided into the following subunits: career development, decision making and problem solving, work ethic, job-seeking skills, job retention skills, job advancement, technology in the workplace, lifelong learning, economic education, balancing work and family, citizenship in the workplace, leadership, and entrepreneurship. Unit 9 (the forest industry) includes subunits on forest nursery operations, forest measurements, forest establishment, forest management, tree harvesting and processing, wildland fire operations, and urban forestry tree care. Unit 10 (resource conservation) contains subunits on the resource conservation industry, water quality management, mapping, nature interpretation, fish and wildlife management awareness, and groundskeeping. A list of competency builders follows each competency listed. (MN)

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O C A P

OHIO'S COMPETENCY ANALYSIS PROFILE

NATURAL RESOURCES

This list consists of essential competencies from the
following specialized OCAPs:

Forest Industry Worker

Resource Conservation

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Ohio Department of Education

Vocational Instructional Materials Laboratory
Center on Education and Training
for Employment



What is OCAP?

"A comprehensive and verified employer competency list will be developed and kept current for each program." This is the second objective of Imperative 3 of the *Action Plan for Accelerating the Modernization of Vocational Education: Ohio's Future at Work*. Ohio's Competency Analysis Profile (OCAP) lists are the Division of Vocational and Career Education's response to that objective. OCAP lists evolve from a modified DACUM process involving business, industry, labor, and community agency representatives from throughout Ohio. The OCAP process is directed by the Vocational Instructional Materials Laboratory at The Ohio State University's Center on Education and Training for Employment.

How is OCAP used?

Each OCAP contains units (with and without subunits), competencies, and competency builders that identify the occupational, academic,* and employability skills needed to enter a given occupation or occupational area. Within that outline there are three levels of items: core, advancing, and futuring. Core items identify the knowledge, skills, and attitudes essential for entry-level employment. These items will be the basis for questions on the state vocational competency tests (scheduled to begin in school year 1993-94). Advancing items (marked with one asterisk) identify the knowledge, skills, and attitudes needed to advance in a given occupation. Futuring items (marked with two asterisks) identify the knowledge, skills, and attitudes needed to enter and remain in a given occupation three to four years from now.

School districts may add as many units, subunits, competencies, and/or competency builders as desired to reflect local employment needs, trends, and specialties. Local advisory committees should be actively involved in the identification and verification of additional items. Using OCAP lists, instructors will be able to formulate their vocational courses of study and monitor competency gains via the new criterion-referenced competency testing program that will be directly tied to the competencies identified on the OCAP lists.

*Academic competencies have not been identified for all OCAPs. At a later date math, communication, and science competencies will be released.

The **Employability Skills** portion of this list was verified by the following employer panel:

Gary J. Corrigan, *Dana Corporation*, Ottawa Lake, Michigan
David Crooks, *Bowling Green State University Union Food Service*, Bowling Green, Ohio
Pat Doerman, *Farrow's Harley-Davidson*, Columbus, Ohio
William Gockenbach, *Kaiser Aluminum*, Heath, Ohio
Patsy Hathaway, *CBS Personnel Services, Inc.*, Dayton, Ohio
Marlyn Harman, *Marlyn Harman & Associates*, Cleveland, Ohio
Thomas R. Hyldahl, *Toledo Edison*, Toledo, Ohio
Carol C. James, *Ohio Contractors Association*, Columbus, Ohio
James Mack, *Chrysler Jeep Assembly*, Toledo, Ohio
Rocky McCoy, *Ironton-Lawrence Co. Community Action Organization*, Ironton, Ohio
James Needs, *Independent Crop Producer*, Upper Sandusky, Ohio
Ronald Simmons, *Former GM Executive*, Warren Ohio

Ohio Competency Analysis Profile

Natural Resources

Unit 1: General Safety Precautions

Competency 1.0.1: Maintain safe work environment

Competency Builders:

- 1.0.1.1 Read and follow safety information
- 1.0.1.2 Organize and maintain clean and safe work area
- 1.0.1.3 Recognize dangers of hazardous materials
- 1.0.1.4 Identify hazardous materials and location of material safety data sheets (MSDSs)
- 1.0.1.5 Store hazardous materials according to manufacturer's specifications
- 1.0.1.6 Comply with shop and equipment safety rules
- 1.0.1.7 Identify agencies that regulate aspects of forest industry
- 1.0.1.8 Identify and report safety hazards
- 1.0.1.9 Correct safety hazards
- 1.0.1.10 Install, maintain, and use safety devices
- 1.0.1.11 Comply with general-use and restricted-use product regulations
- 1.0.1.12 Comply with responder first-aid and cardiopulmonary resuscitation (CPR) certification standards
- 1.0.1.13 Complete accident report
- 1.0.1.14 Recognize major environmental issues pertaining to forest industry
- 1.0.1.15 Monitor regulation updates*

Competency 1.0.2: Demonstrate safe work habits

Competency Builders:

- 1.0.2.1 Read and follow label information
- 1.0.2.2 Wear and maintain protective clothing and equipment
- 1.0.2.3 Wear appropriate clothing for job
- 1.0.2.4 Use safe lifting and carrying methods
- 1.0.2.5 Determine physical needs for specific occupational tasks
- 1.0.2.6 Interpret information on signs
- 1.0.2.7 Check fit of respirator
- 1.0.2.8 Check and maintain working condition of respirator
- 1.0.2.9 Comply with safety precautions when applying chemicals and fertilizer
- 1.0.2.10 Comply with safety precautions when storing chemicals and fertilizer
- 1.0.2.11 Follow personal cleanup procedures after handling chemicals and fertilizer
- 1.0.2.12 Clean up and dispose of chemicals and chemical containers according to manual specifications and/or government regulations
- 1.0.2.13 Comply with safety precautions when handling chemical or fertilizer spill
- 1.0.2.14 Develop physical fitness program to achieve level of conditioning for job

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Competency 1.0.3: Operate and maintain equipment

Competency Builders:

- 1.0.3.1 Follow state, federal, and/or manufacturer's safety rules for equipment operation and maintenance
- 1.0.3.2 Observe and comply with safety zones around equipment
- 1.0.3.3 Operate equipment defensively
- 1.0.3.4 Interpret safety symbols
- 1.0.3.5 Maintain and use slow-moving-vehicle signs when operating vehicles on road
- 1.0.3.6 Keep riders off mobile equipment
- 1.0.3.7 Maintain safety devices on all equipment
- 1.0.3.8 Shut down and lock out/tag out power equipment before servicing
- 1.0.3.9 Identify and take appropriate action to correct potential equipment safety hazards
- 1.0.3.10 Follow manufacturer's service recommendations

Competency 1.0.4: Respond to critical incidents

Competency Builders:

- 1.0.4.1 Observe and identify hazardous situations
- 1.0.4.2 Report situations to supervisor
- 1.0.4.3 Initiate follow-through procedures
- 1.0.4.4 Initiate response*
- 1.0.4.5 Complete incident report*

Unit 2: Natural Resource Industry Operations

Competency 2.0.1: Evaluate natural resource industry

Competency Builders:

- 2.0.1.1 Identify fields of endeavor
- 2.0.1.2 Identify types of forest products
- 2.0.1.3 Recognize economic importance of industry
- 2.0.1.4 Recognize environmental importance of industry
- 2.0.1.5 Identify employment opportunities
- 2.0.1.6 Recognize regulatory aspects of industry
- 2.0.1.7 Identify continuing-education opportunities
- 2.0.1.8 Identify professional organizations and trade journals
- 2.0.1.9 Identify state licensing or certification requirements
- 2.0.1.10 Use proper industry terminology

Competency 2.0.2: Examine plant physiology and growth

Competency Builders:

- 2.0.2.1 Describe woody and herbaceous plants
- 2.0.2.2 Identify plant parts
- 2.0.2.3 Identify photosynthesis process
- 2.0.2.4 Identify functions of roots, stems, and leaves
- 2.0.2.5 Identify requirements for healthy plant growth
- 2.0.2.6 Identify taproot and fibrous root systems

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- 2.0.2.7 Identify differences between evergreen and deciduous plants
- 2.0.2.8 Identify areas of growth on individual trees
- 2.0.2.9 Identify physical factors affecting forest environment
- 2.0.2.10 Identify biological factors affecting forest environment
- 2.0.2.11 Identify physical and chemical characteristics of wood
- 2.0.2.12 Take core sample
- 2.0.2.13 Measure tree growth
- 2.0.2.14 Measure growth rate

Competency 2.0.3: Identify common trees and associated plants

Competency Builders:

- 2.0.3.1 Classify plants as monocots or dicots
- 2.0.3.2 Identify plants according to common names
- 2.0.3.3 Identify plants according to scientific names
- 2.0.3.4 Identify purpose of binomial nomenclature
- 2.0.3.5 Classify plants as annuals, biennials, or perennials
- 2.0.3.6 Identify environmental plant preferences
- 2.0.3.7 Classify plants according to growth habit
- 2.0.3.8 Identify leaf type
- 2.0.3.9 Identify twig features
- 2.0.3.10 Identify bark features
- 2.0.3.11 Identify types of fruits and seeds
- 2.0.3.12 Identify root components
- 2.0.3.13 Classify trees by crown position
- 2.0.3.14 Classify stand of timber by forest type
- 2.0.3.15 Classify timber stand by size class
- 2.0.3.16 Classify trees by economic value

Unit 3: Soil Conservation

Competency 3.0.1: Identify soil characteristics

Competency Builders:

- 3.0.1.1 Follow general safety precautions
- 3.0.1.2 Define soil horizons
- 3.0.1.3 Calculate land slope
- 3.0.1.4 Determine soil texture
- 3.0.1.5 Determine percent organic matter
- 3.0.1.6 Identify soil structure
- 3.0.1.7 Determine soil type
- 3.0.1.8 Determine soil drainage
- 3.0.1.9 Determine soil productivity
- 3.0.1.10 Determine soil management problems
- 3.0.1.11 Comply with government regulations and guidelines
- 3.0.1.12 Determine and implement management and conservation practices*

* Advancing

** Futuring

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Competency 3.0.2: Conserve soil

Competency Builders:

- 3.0.2.1 Follow general safety precautions
- 3.0.2.2 Determine land capability classification
- 3.0.2.3 Determine erosion rates
- 3.0.2.4 Interpret aerial photos
- 3.0.2.5 Interpret soil survey maps
- 3.0.2.6 Identify erosion types
- 3.0.2.7 Identify erosion causes
- 3.0.2.8 Identify soil erosion control methods

Unit 4: Equipment Maintenance

Competency 4.0.1: Maintain equipment

Competency Builders:

- 4.0.1.1 Follow general safety precautions
- 4.0.1.2 Calibrate equipment
- 4.0.1.3 Adjust belts
- 4.0.1.4 Adjust chains
- 4.0.1.5 Inspect and report operating defects
- 4.0.1.6 Clean and lubricate parts
- 4.0.1.7 Sharpen equipment
- 4.0.1.8 Maintain service records

Competency 4.0.2: Maintain chain saw

Competency Builders:

- 4.0.2.1 Follow general safety precautions
- 4.0.2.2 Remove and install saw guide, bar, and chain
- 4.0.2.3 Adjust chain tension
- 4.0.2.4 Sharpen chain
- 4.0.2.5 Service guide bar and chain
- 4.0.2.6 Replace chain
- 4.0.2.7 Service air filter
- 4.0.2.8 Service spark plug
- 4.0.2.9 Service exhaust system
- 4.0.2.10 Perform spark test
- 4.0.2.11 Inspect fuel system

Competency 4.0.3: Maintain spraying equipment

Competency Builders:

- 4.0.3.1 Follow general safety precautions
- 4.0.3.2 Clean and inspect spray nozzles
- 4.0.3.3 Select spray nozzles
- 4.0.3.4 Calibrate equipment
- 4.0.3.5 Inspect hose and connections
- 4.0.3.6 Pressure-check hoses
- 4.0.3.7 Clean and inspect tanks
- 4.0.3.8 Repair hose
- 4.0.3.9 Troubleshoot problems

Competency 4.0.4: Service engine cooling systems

Competency Builders:

- 4.0.4.1 Follow general safety precautions
- 4.0.4.2 Test coolant mixture
- 4.0.4.3 Add coolant
- 4.0.4.4 Replace hoses
- 4.0.4.5 Adjust or replace fan belt
- 4.0.4.6 Inspect for leaks
- 4.0.4.7 Flush cooling system
- 4.0.4.8 Dispose of coolant
- 4.0.4.9 Troubleshoot problems

Competency 4.0.5: Service engine lubrication systems

Competency Builders:

- 4.0.5.1 Follow general safety precautions
- 4.0.5.2 Check oil level
- 4.0.5.3 Select oil
- 4.0.5.4 Change oil and oil filters
- 4.0.5.5 Grease or oil joints
- 4.0.5.6 Maintain grease fittings
- 4.0.5.7 Dispose of oil
- 4.0.5.8 Troubleshoot problems

Competency 4.0.6: Service engine fuel and air systems

Competency Builders:

- 4.0.6.1 Follow general safety precautions
- 4.0.6.2 Service air cleaner
- 4.0.6.3 Bleed diesel fuel system
- 4.0.6.4 Mix gas and oil for two-cycle engine
- 4.0.6.5 Clean and service crankcase ventilation components
- 4.0.6.6 Clean carburetor
- 4.0.6.7 Adjust small-engine carburetor
- 4.0.6.8 Service fuel filter assembly
- 4.0.6.9 Replace exhaust system components

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- 4.0.6.10 Clean small-engine exhaust ports
- 4.0.6.11 Adjust engine valves
- 4.0.6.12 Distinguish differences between two-cycle and four-cycle engines
- 4.0.6.13 Troubleshoot problems

Competency 4.0.7: Service engine electrical systems

Competency Builders:

- 4.0.7.1 Follow general safety precautions
- 4.0.7.2 Inspect and replace distributor cap and rotor
- 4.0.7.3 Replace spark plugs and wires
- 4.0.7.4 Clean spark plugs
- 4.0.7.5 Adjust spark plug gap
- 4.0.7.6 Inspect, change, and adjust breaker points
- 4.0.7.7 Check specific gravity of battery
- 4.0.7.8 Install battery
- 4.0.7.9 Clean and treat battery terminals, cables, and battery box
- 4.0.7.10 Charge battery
- 4.0.7.11 Replace fuses
- 4.0.7.12 Replace light bulbs
- 4.0.7.13 Jump-start vehicle
- 4.0.7.14 Troubleshoot problems

Competency 4.0.8: Service wheels and tires

Competency Builders:

- 4.0.8.1 Follow general safety precautions
- 4.0.8.2 Inspect tires
- 4.0.8.3 Check tire pressure
- 4.0.8.4 Inflate tires
- 4.0.8.5 Check and tighten lug nuts
- 4.0.8.6 Remove and replace wheels
- 4.0.8.7 Rotate tires
- 4.0.8.8 Check valve stems
- 4.0.8.9 Patch tubes
- 4.0.8.10 Troubleshoot problems

Competency 4.0.9: Service hydraulic systems

Competency Builders:

- 4.0.9.1 Follow general safety precautions
- 4.0.9.2 Identify reservoir
- 4.0.9.3 Select oil
- 4.0.9.4 Check and add oil
- 4.0.9.5 Replace oil filter
- 4.0.9.6 Bleed air from system
- 4.0.9.7 Inspect system for oil leaks
- 4.0.9.8 Clean couplings
- 4.0.9.9 Inspect and replace hoses
- 4.0.9.10 Troubleshoot problems

Competency 4.0.10: Clean and store equipment

Competency Builders:

- 4.0.10.1 Follow general safety precautions
- 4.0.10.2 Remove equipment from storage
- 4.0.10.3 Remove debris from equipment
- 4.0.10.4 Use steam or high-pressure wash equipment
- 4.0.10.5 Prepare engines for storage
- 4.0.10.6 Lubricate equipment
- 4.0.10.7 Drain water systems
- 4.0.10.8 Return equipment to storage

Competency 4.0.11: Weld with gas

Competency Builders:

- 4.0.11.1 Follow general safety precautions
- 4.0.11.2 Set up and adjust gas welding equipment
- 4.0.11.3 Select rod
- 4.0.11.4 Select and apply flux
- 4.0.11.5 Cut metal
- 4.0.11.6 Weld steel in horizontal positions
- 4.0.11.7 Weld steel with filler rod
- 4.0.11.8 Braze metal
- 4.0.11.9 Clean and store equipment
- 4.0.11.10 Secure and store gas cylinders

Competency 4.0.12: Weld with electric arc and MIG

Competency Builders:

- 4.0.12.1 Follow general safety precautions
- 4.0.12.2 Select welding equipment and accessories
- 4.0.12.3 Select electrode sizes and types
- 4.0.12.4 Select settings
- 4.0.12.5 Prepare metal
- 4.0.12.6 Weld steel in nonhorizontal positions
- 4.0.12.7 Weld pipe
- 4.0.12.8 Cut metal
- 4.0.12.9 Clean and store equipment
- 4.0.12.10 Weld steel in horizontal positions

Competency 4.0.13: Fabricate with metal

Competency Builders:

- 4.0.13.1 Follow general safety precautions
- 4.0.13.2 Identify types of metal
- 4.0.13.3 Design plans
- 4.0.13.4 Prepare bill of materials
- 4.0.13.5 Measure thickness of sheet metal
- 4.0.13.6 Test metal for type and hardness
- 4.0.13.7 Punch and drill metal

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* Advancing

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- 4.0.13.8 Cut metal
- 4.0.13.9 Select thread and size for tap or die
- 4.0.13.10 Thread hole or rod
- 4.0.13.11 Grind metal
- 4.0.13.12 Join metal
- 4.0.13.13 Bend sheet metal
- 4.0.13.14 Store metal

Competency 4.0.14: Service belt and drive chain assemblies

Competency Builders:

- 4.0.14.1 Follow general safety precautions
- 4.0.14.2 Replace and adjust belts
- 4.0.14.3 Replace and adjust gear assembly
- 4.0.14.4 Replace and adjust chains
- 4.0.14.5 Replace pulleys and rollers
- 4.0.14.6 Clean and lubricate drive parts
- 4.0.14.7 Troubleshoot problems

Competency 4.0.15: Lubricate equipment

Competency Builders:

- 4.0.15.1 Follow general safety precautions
- 4.0.15.2 Identify service points
- 4.0.15.3 Select lubricant
- 4.0.15.4 Maintain grease fittings
- 4.0.15.5 Apply lubricant

Unit 5: Equipment Operation

Competency 5.0.1: Perform prestart functions

Competency Builders:

- 5.0.1.1 Follow general safety precautions
- 5.0.1.2 Refuel power units
- 5.0.1.3 Inspect working condition of lights
- 5.0.1.4 Select fuel
- 5.0.1.5 Check prestart mechanism
- 5.0.1.6 Flag extended materials
- 5.0.1.7 Turn on boat air blower
- 5.0.1.8 Secure equipment and materials
- 5.0.1.9 Troubleshoot problems

Competency 5.0.2: Hitch equipment to power unit

Competency Builders:

- 5.0.2.1 Follow general safety precautions
- 5.0.2.2 Connect front-end-operated equipment
- 5.0.2.3 Connect 3-point-hitch equipment
- 5.0.2.4 Attach and detach power takeoff equipment
- 5.0.2.5 Hitch towed equipment
- 5.0.2.6 Connect hydraulic lines
- 5.0.2.7 Connect electrical hookups
- 5.0.2.8 Connect safety chains

Competency 5.0.3: Operate equipment and vehicles

Competency Builders:

- 5.0.3.1 Follow general safety precautions
- 5.0.3.2 Set throttle for operating conditions
- 5.0.3.3 Interpret equipment gauges
- 5.0.3.4 Start and shut down engine
- 5.0.3.5 Use hand operating signals
- 5.0.3.6 Operate manual transmission
- 5.0.3.7 Operate automatic transmission
- 5.0.3.8 Operate brake system
- 5.0.3.9 Adjust seating and steering
- 5.0.3.10 Preheat diesels
- 5.0.3.11 Park equipment and vehicles
- 5.0.3.12 Operate liftgates
- 5.0.3.13 Operate dump gates
- 5.0.3.14 Operate winch
- 5.0.3.15 Operate hydraulics
- 5.0.3.16 Operate power takeoff
- 5.0.3.17 Operate outboard motor
- 5.0.3.18 Adjust equipment for field conditions
- 5.0.3.19 Comply with all government regulations regarding equipment operation

Competency 5.0.4: Operate chain saw

Competency Builders:

- 5.0.4.1 Follow general safety precautions
- 5.0.4.2 Identify chain saw parts
- 5.0.4.3 Identify parts of saw chain
- 5.0.4.4 Conduct preoperating maintenance inspection
- 5.0.4.5 Start saw
- 5.0.4.6 Make overbuck cut
- 5.0.4.7 Make underbuck cut
- 5.0.4.8 Determine tree's line of fall
- 5.0.4.9 Identify use of wedges in felling operation
- 5.0.4.10 Determine escape route
- 5.0.4.11 Make notch cut
- 5.0.4.12 Make back cut

Unit 6: Facility Construction and Maintenance

Competency 6.0.1: Use and maintain equipment

Competency Builders:

- 6.0.1.1 Follow general safety precautions
- 6.0.1.2 Identify tools
- 6.0.1.3 Select tools
- 6.0.1.4 Read and follow operation instructions
- 6.0.1.5 Set up and adjust tools
- 6.0.1.6 Clean and lubricate tools
- 6.0.1.7 Store tools
- 6.0.1.8 Sharpen tools
- 6.0.1.9 Read measuring device
- 6.0.1.10 Recondition tools
- 6.0.1.11 Troubleshoot problems

Competency 6.0.2: Install and maintain fencing

Competency Builders:

- 6.0.2.1 Follow general safety precautions
- 6.0.2.2 Identify fencing system options
- 6.0.2.3 Determine amount of fence required
- 6.0.2.4 Select fencing materials
- 6.0.2.5 Select posts and braces
- 6.0.2.6 Set posts and braces
- 6.0.2.7 Attach fasteners
- 6.0.2.8 Identify fasteners
- 6.0.2.9 Hang fence
- 6.0.2.10 Hang gates
- 6.0.2.11 Lay out and stretch fence
- 6.0.2.12 Remove fencing
- 6.0.2.13 Troubleshoot problems

Competency 6.0.3: Construct with wood

Competency Builders:

- 6.0.3.1 Follow general safety precautions
- 6.0.3.2 Cut lumber to dimension
- 6.0.3.3 Assemble joints with glue
- 6.0.3.4 Cut and fit joints
- 6.0.3.5 Select and use metal fasteners
- 6.0.3.6 Cut and set ties and poles
- 6.0.3.7 Identify types of woods
- 6.0.3.8 Install and repair bracing
- 6.0.3.9 Read plan
- 6.0.3.10 Troubleshoot problems
- 6.0.3.11 Install and repair doors*

* Advancing
** Futuring

Competency 6.0.4: Maintain electrical systems

Competency Builders:

- 6.0.4.1 Follow general safety precautions
- 6.0.4.2 Read electric meter
- 6.0.4.3 Replace fuses
- 6.0.4.4 Reset circuit breakers
- 6.0.4.5 Repair extension cords
- 6.0.4.6 Replace outlets and switches
- 6.0.4.7 Maintain lighting fixtures
- 6.0.4.8 Identify electrical fundamentals
- 6.0.4.9 Clean and lubricate motors*

Competency 6.0.5: Apply protective coatings

Competency Builders:

- 6.0.5.1 Follow general safety precautions
- 6.0.5.2 Determine type of coating and application
- 6.0.5.3 Clean and sand surface
- 6.0.5.4 Apply masking tape
- 6.0.5.5 Thin paint
- 6.0.5.6 Mix and apply primer coat
- 6.0.5.7 Apply finish coat
- 6.0.5.8 Apply wood preservative
- 6.0.5.9 Clean up equipment
- 6.0.5.10 Identify types and uses of coatings

Competency 6.0.6: Install and maintain water system

Competency Builders:

- 6.0.6.1 Follow general safety precautions
- 6.0.6.2 Cut pipe or tubing
- 6.0.6.3 Fit pipe and pipe fittings
- 6.0.6.4 Thread metal pipe
- 6.0.6.5 Identify pipe and tubing types
- 6.0.6.6 Install pipe and pipe fittings
- 6.0.6.7 Install and repair valves and faucets
- 6.0.6.8 Set up portable pumps
- 6.0.6.9 Install insulation
- 6.0.6.10 Install filters
- 6.0.6.11 Unclog pipes
- 6.0.6.12 Locate existing underground waterlines
- 6.0.6.13 Open and backfill trench line
- 6.0.6.14 Replace gaskets
- 6.0.6.15 Install sprinkler heads
- 6.0.6.16 Winterize system
- 6.0.6.17 Troubleshoot problems
- 6.0.6.18 Install flow-control devices*
- 6.0.6.19 Tap into existing waterlines*
- 6.0.6.20 Test and adjust sprinkler spray patterns*

* Advancing

** Futuring

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Competency 6.0.7: Operate sprinkler system

Competency Builders:

- 6.0.7.1 Follow general safety precautions
- 6.0.7.2 Program automatic timers
- 6.0.7.3 Adjust sprinkler patterns
- 6.0.7.4 Adjust water pressure
- 6.0.7.5 Determine sprinkler precipitation rate
- 6.0.7.6 Troubleshoot problems

Competency 6.0.8: Construct with concrete*

Competency Builders:

- 6.0.8.1 Follow general safety precautions*
- 6.0.8.2 Use survey level*
- 6.0.8.3 Select concrete materials and additives*
- 6.0.8.4 Select and use concrete tools*
- 6.0.8.5 Calculate volume of concrete to order or mix*
- 6.0.8.6 Excavate structure sites for concrete pouring*
- 6.0.8.7 Install concrete reinforcement*
- 6.0.8.8 Build and remove concrete forms*
- 6.0.8.9 Mix and pour concrete*
- 6.0.8.10 Finish concrete surface*
- 6.0.8.11 Cure concrete*
- 6.0.8.12 Lay block*
- 6.0.8.13 Lay brick*
- 6.0.8.14 Install edging*

Competency 6.0.9: Construct with stone*

Competency Builders:

- 6.0.9.1 Follow general safety precautions*
- 6.0.9.2 Lay stone*
- 6.0.9.3 Lay gravel*
- 6.0.9.4 Install walkways*
- 6.0.9.5 Construct a wall*
- 6.0.9.6 Set landscape stones*

Unit 7: Business Management

Competency 7.0.1: Perform general office duties

Competency Builders:

- 7.0.1.1 Process mail
- 7.0.1.2 Duplicate materials
- 7.0.1.3 File materials
- 7.0.1.4 Prepare correspondence
- 7.0.1.5 Prepare reports
- 7.0.1.6 Secure business documents

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- 7.0.1.7 Schedule appointments and meetings
- 7.0.1.8 Plan work schedules
- 7.0.1.9 Open and close business facility
- 7.0.1.10 Use telephone
- 7.0.1.11 Operate calculator
- 7.0.1.12 Use two-way radio
- 7.0.1.13 Operate computer
- 7.0.1.14 Use fax machine
- 7.0.1.15 Maintain service records

Competency 7.0.2: Conduct general banking procedures

Competency Builders:

- 7.0.2.1 Prepare bank deposit
- 7.0.2.2 Make bank deposit
- 7.0.2.3 Write check
- 7.0.2.4 Cash check
- 7.0.2.5 Balance bank statement
- 7.0.2.6 Balance checking account

Competency 7.0.3: Analyze marketing and sales opportunities

Competency Builders:

- 7.0.3.1 Determine methods of establishing a business
- 7.0.3.2 Select business location
- 7.0.3.3 Promote products and services
- 7.0.3.4 Market services
- 7.0.3.5 Prepare estimate
- 7.0.3.6 Develop pricing policies
- 7.0.3.7 Conduct sale

Competency 7.0.4: Ship merchandise

Competency Builders:

- 7.0.4.1 Follow general safety precautions
- 7.0.4.2 Record shipments
- 7.0.4.3 Load merchandise
- 7.0.4.4 Secure load
- 7.0.4.5 Prepare shipping documents
- 7.0.4.6 Arrange delivery
- 7.0.4.7 Determine delivery route
- 7.0.4.8 Process special orders
- 7.0.4.9 Process returns to vendors
- 7.0.4.10 Calculate shipping charges
- 7.0.4.11 Comply with government regulations

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Competency 7.0.5: Keep customer accounts

Competency Builders:

- 7.0.5.1 Set up customer file
- 7.0.5.2 Identify importance of checking customer credit references
- 7.0.5.3 Post receipts
- 7.0.5.4 Balance customer accounts
- 7.0.5.5 Prepare statements
- 7.0.5.6 Prepare invoices

Competency 7.0.6: Minimize loss

Competency Builders:

- 7.0.6.1 Examine effect of theft or losses on profit
- 7.0.6.2 Identify potential loss situations
- 7.0.6.3 Maintain organized work area
- 7.0.6.4 Interpret laws regarding loss
- 7.0.6.5 Identify and follow business policy for handling instances of theft

Competency 7.0.7: Manage business finance

Competency Builders:

- 7.0.7.1 Prepare budget
- 7.0.7.2 Calculate insurance needs
- 7.0.7.3 Identify sources of business capital
- 7.0.7.4 Interpret financial statements
- 7.0.7.5 Record accounts payable
- 7.0.7.6 Record accounts receivable
- 7.0.7.7 Prepare cash flow statements
- 7.0.7.8 Calculate overhead costs

Competency 7.0.8: Control inventory

Competency Builders:

- 7.0.8.1 Follow safety precautions
- 7.0.8.2 Organize storage area
- 7.0.8.3 Organize sales area
- 7.0.8.4 Conduct physical inventory
- 7.0.8.5 Determine quantity of bulk items
- 7.0.8.6 Maintain inventory records

Competency 7.0.9: Order merchandise

Competency Builders:

- 7.0.9.1 Determine when to order
- 7.0.9.2 Select vendors
- 7.0.9.3 Use vendor discounts
- 7.0.9.4 Calculate shipping charges
- 7.0.9.5 Determine amount of storage needed

Competency 7.0.10: Receive merchandise

Competency Builders:

- 7.0.10.1 Follow general safety precautions
- 7.0.10.2 Verify order
- 7.0.10.3 Unpack merchandise
- 7.0.10.4 Interpret packing slips and invoices
- 7.0.10.5 Check merchandise for shipping discrepancies
- 7.0.10.6 Inspect merchandise for damage
- 7.0.10.7 Distribute merchandise to designated location

Competency 7.0.11: Perform public relations work

Competency Builders:

- 7.0.11.1 Explain forestry objectives
- 7.0.11.2 Prepare reports
- 7.0.11.3 Prepare literature
- 7.0.11.4 Obtain and interpret forestry information
- 7.0.11.5 Write news releases
- 7.0.11.6 Describe interaction with government agencies and other organizations

Unit 8: Employability Skills

Subunit 8.1: Career Development

Competency 8.1.1: Investigate career options

Competency Builders:

- 8.1.1.1 Determine interests and aptitudes
- 8.1.1.2 Identify career options
- 8.1.1.3 Research occupations matching interests and aptitudes
- 8.1.1.4 Select career(s) that best match(es) interests and aptitudes
- 8.1.1.5 Identify advantages and disadvantages of career options, including nontraditional careers
- 8.1.1.6 Assess differences in wages, annual incomes, and job opportunities based on geographic location
- 8.1.1.7 Develop a career plan

Competency 8.1.2: Analyze potential barriers to employment

Competency Builders:

- 8.1.2.1 Identify common barriers to employment
- 8.1.2.2 Describe strategies to overcome employment barriers

Unit 8: Employability Skills

Subunit 8.2: Decision Making and Problem Solving

Competency 8.2.1: Apply decision-making techniques in the workplace

Competency Builders:

- 8.2.1.1 Identify the decision to be made
- 8.2.1.2 Compare alternatives
- 8.2.1.3 Determine consequences of each alternative
- 8.2.1.4 Make decisions based on values and goals
- 8.2.1.5 Evaluate the decision made

Competency 8.2.2: Apply problem-solving techniques in the workplace

Competency Builders:

- 8.2.2.1 Diagnose the problem and its causes
- 8.2.2.2 Identify alternatives and their consequences in relation to the problem
- 8.2.2.3 Examine multicultural and nonsexist dimensions of problem solving
- 8.2.2.4 Utilize resources to explore possible solutions to the problem
- 8.2.2.5 Compare and contrast the advantages and disadvantages of each solution
- 8.2.2.6 Determine appropriate action
- 8.2.2.7 Evaluate results

Unit 8: Employability Skills

Subunit 8.3: Work Ethic

Competency 8.3.1: Evaluate the relationship of self-esteem to work ethic

Competency Builders:

- 8.3.1.1 Identify special characteristics and abilities in self and others
- 8.3.1.2 Identify internal and external factors that affect self-esteem

Competency 8.3.2: Analyze the relationship of personal values and goals to work ethic both in and out of the workplace

Competency Builders:

- 8.3.2.1 Distinguish between values and goals
- 8.3.2.2 Determine the importance of values and goals
- 8.3.2.3 Evaluate how values affect goals
- 8.3.2.4 Identify short-term and long-term goals
- 8.3.2.5 Prioritize personal goals
- 8.3.2.6 Describe how personal values are reflected in work ethic
- 8.3.2.7 Describe how interactions in the workplace affect personal work ethic
- 8.3.2.8 Examine how life changes affect personal work ethic

Competency 8.3.3: Demonstrate work ethic

Competency Builders:

- 8.3.3.1 Examine factors that influence work ethic
- 8.3.3.2 Exhibit characteristics that reflect an appropriate work ethic

Unit 8: Employability Skills

Subunit 8.4: Job-Seeking Skills

Competency 8.4.1: Prepare for employment

Competency Builders:

- 8.4.1.1 Identify traditional and nontraditional employment sources
- 8.4.1.2 Utilize employment sources
- 8.4.1.3 Research job opportunities, including nontraditional careers
- 8.4.1.4 Interpret equal employment opportunity laws
- 8.4.1.5 Explain the critical importance of personal appearance, hygiene, and demeanor throughout the employment process
- 8.4.1.6 Prepare for generic employment tests and those specific to an occupation/organization

Competency 8.4.2: Design a résumé

Competency Builders:

- 8.4.2.1 Identify personal strengths and weaknesses
- 8.4.2.2 List skills and/or abilities, career objective(s), accomplishments/achievements, educational background, and work experience
- 8.4.2.3 Demonstrate legible written communication skills using correct grammar, spelling, and concise wording
- 8.4.2.4 Complete résumé using various formats
- 8.4.2.5 Secure references

Competency 8.4.3: Complete and process job application forms

Competency Builders:

- 8.4.3.1 Explain the importance of an application form
- 8.4.3.2 Identify ways to obtain job application forms
- 8.4.3.3 Describe methods for handling illegal questions on job application forms
- 8.4.3.4 Demonstrate legible written communication skills using correct grammar, spelling, and concise wording
- 8.4.3.5 Return application to proper person, request interview, and follow up

Competency 8.4.4: Demonstrate interviewing skills

Competency Builders:

- 8.4.4.1 Investigate interview environment and procedures
- 8.4.4.2 Explain the critical importance of personal appearance, hygiene, and demeanor
- 8.4.4.3 Demonstrate question and answer techniques
- 8.4.4.4 Demonstrate methods for handling difficult and/or illegal interview questions

Competency 8.4.5: Secure employment

Competency Builders:

- 8.4.5.1 Identify present and future employment opportunities within an occupation/organization
- 8.4.5.2 Research the organization/company
- 8.4.5.3 Use follow-up techniques to enhance employment potential
- 8.4.5.4 Compare and evaluate job offers

Unit 8: Employability Skills

Subunit 8.5: Job Retention Skills

Competency 8.5.1: Analyze the organizational structure of the workplace

Competency Builders:

- 8.5.1.1 Identify and evaluate employer expectations regarding job performance, work habits, attitudes, personal appearance, and hygiene
- 8.5.1.2 Be aware of and obey all company policies and procedures
- 8.5.1.3 Examine the role/relationship between employee and employer
- 8.5.1.4 Recognize opportunities for advancement and reasons for termination

Competency 8.5.2: Maintain positive relations with others

Competency Builders:

- 8.5.2.1 Exhibit appropriate work habits and attitude
- 8.5.2.2 Identify behaviors to establish successful working relationships
- 8.5.2.3 Cooperate and compromise through teamwork and group participation
- 8.5.2.4 Identify alternatives for dealing with harassment, bias, and discrimination based on race, color, national origin, sex, religion, handicap, or age

Unit 8: Employability Skills

Subunit 8.6: Job Advancement

Competency 8.6.1: Analyze opportunities for personal and career growth

Competency Builders:

- 8.6.1.1 Determine opportunities within an occupation/organization
- 8.6.1.2 Compare and contrast other opportunities
- 8.6.1.3 List benefits of job advancement
- 8.6.1.4 Evaluate factors involved when assuming a new position within or outside an occupation/organization

Competency 8.6.2: Exhibit characteristics needed for advancement

Competency Builders:

- 8.6.2.1 Display a positive attitude
- 8.6.2.2 Demonstrate knowledge of a position
- 8.6.2.3 Perform quality work
- 8.6.2.4 Adapt to changing situations and technology
- 8.6.2.5 Demonstrate capability for different positions
- 8.6.2.6 Participate in continuing education/training programs
- 8.6.2.7 Respect, accept, and work with ALL individuals in the workplace

Unit 8: Employability Skills

Subunit 8.7: Technology in the Workplace

Competency 8.7.1: Assess the impact of technology in the workplace

Competency Builders:

- 8.7.1.1 Cite how past business/industry practices have influenced present business/industry processes
- 8.7.1.2 Investigate the use of technology in the workplace
- 8.7.1.3 Analyze how present skills can be applied to learning new technologies

Competency 8.7.2: Use a variety of technological applications

Competency Builders:

- 8.7.2.1 Explore basic mathematical, scientific, computer, and technological principles
- 8.7.2.2 Use technology to accomplish assigned tasks
- 8.7.2.3 Create solutions to problems using technical means

Unit 8: Employability Skills

Subunit 8.8: Lifelong Learning

Competency 8.8.1: Apply lifelong learning to individual situations

Competency Builders:

- 8.8.1.1 Define lifelong learning
- 8.8.1.2 Identify factors that cause the need for lifelong learning

Competency 8.8.2: Adapt to change

Competency Builders:

- 8.8.2.1 Analyze the effects of change
- 8.8.2.2 Identify reasons why goals change
- 8.8.2.3 Describe the importance of flexibility when reevaluating goals
- 8.8.2.4 Evaluate the need for continuing education/training

Unit 8: Employability Skills

Subunit 8.9: Economic Education

Competency 8.9.1: Analyze global enterprise system

Competency Builders:

- 8.9.1.1 Identify characteristics of various enterprise systems
- 8.9.1.2 Examine the relationship between competition, risk, and profit
- 8.9.1.3 Illustrate how supply and demand influence price

Competency 8.9.2: Evaluate personal money management

Competency Builders:

- 8.9.2.1 Describe the need for personal management records
- 8.9.2.2 Identify methods of taxation
- 8.9.2.3 Analyze how credit affects financial security
- 8.9.2.4 Compare types and methods of investments
- 8.9.2.5 Prepare a personal budget
- 8.9.2.6 Be an informed and responsible consumer
- 8.9.2.7 Analyze the effects of advertising on the consumer

Unit 8: Employability Skills

Subunit 8.10: Balancing Work and Family

Competency 8.10.1: Analyze the effects of family on work

Competency Builders:

- 8.10.1.1 Recognize how family values, goals, and priorities are reflected in the workplace
- 8.10.1.2 Identify present and future family structures and responsibilities
- 8.10.1.3 Describe personal and family roles
- 8.10.1.4 Analyze concerns of working parent(s)
- 8.10.1.5 Examine how family responsibilities can conflict with work
- 8.10.1.6 Resolve family-related conflicts
- 8.10.1.7 Explain how to use support systems/community resources to help resolve family-related conflicts

Competency 8.10.2: Analyze the effects of work on family

Competency Builders:

- 8.10.2.1 Identify responsibilities associated with paid and nonpaid work
- 8.10.2.2 Compare the advantages and disadvantages of multiple incomes
- 8.10.2.3 Explain how work can conflict with family responsibilities
- 8.10.2.4 Explain how work-related stress can affect families
- 8.10.2.5 Identify family support systems and resources

Unit 8: Employability Skills

Subunit 8.11: Citizenship in the Workplace

Competency 8.11.1: Exercise the rights and responsibilities of citizenship in the workplace

Competency Builders:

- 8.11.1.1 Identify the basic rights and responsibilities of citizenship
- 8.11.1.2 Examine the history and contributions of all racial, ethnic, and cultural groups

Competency 8.11.2: Cooperate with others in the workplace

Competency Builders:

- 8.11.2.1 Identify situations in which compromise is necessary
- 8.11.2.2 Examine how individuals from various backgrounds contribute to work-related situations
- 8.11.2.3 Demonstrate initiative to facilitate cooperation
- 8.11.2.4 Give and receive constructive criticism to enhance cooperation

Unit 8: Employability Skills

Subunit 8.12: Leadership

Competency 8.12.1: Evaluate leadership styles appropriate for the workplace

Competency Builders:

- 8.12.1.1 Identify characteristics of effective leaders
- 8.12.1.2 Compare leadership styles
- 8.12.1.3 Demonstrate effective delegation skills
- 8.12.1.4 Identify opportunities to lead in the workplace

Competency 8.12.2: Demonstrate effective teamwork skills

Competency Builders:

- 8.12.2.1 Identify the responsibilities of a valuable group member
- 8.12.2.2 Exhibit open-mindedness
- 8.12.2.3 Identify methods of involving each member of a team
- 8.12.2.4 Contribute to the efficiency and success of a group
- 8.12.2.5 Determine ways to motivate others

Competency 8.12.3: Utilize effective communication skills

Competency Builders:

- 8.12.3.1 Identify the importance of listening
- 8.12.3.2 Demonstrate assertive communication
- 8.12.3.3 Recognize the importance of verbal and nonverbal cues and messages
- 8.12.3.4 Analyze written material
- 8.12.3.5 Prepare written material
- 8.12.3.6 Give and receive feedback
- 8.12.3.7 Articulate thoughts
- 8.12.3.8 Use appropriate language

Unit 8: Employability Skills

Subunit 8.13: Entrepreneurship

Competency 8.13.1: Evaluate the role of small business in the economy

Competency Builders:

- 8.13.1.1 Identify the benefits of small business to a community
- 8.13.1.2 Analyze opportunities for small business in a community

Competency 8.13.2: Examine considerations of starting a business

Competency Builders:

- 8.13.2.1 Research a business idea
- 8.13.2.2 Compare various ways to become a small business owner
- 8.13.2.3 Investigate factors to consider in financing a new business
- 8.13.2.4 Evaluate entrepreneurship as a career option

Unit 9: Forest Industry

Subunit 9.1: Forest Nursery Operations

Competency 9.1.1: Prepare nursery site

Competency Builders:

- 9.1.1.1 Follow general safety precautions
- 9.1.1.2 Identify features to consider in selecting site
- 9.1.1.3 Identify factors involved in planning propagation facilities
- 9.1.1.4 Till and cultivate site
- 9.1.1.5 Identify basics of greenhouse structures
- 9.1.1.6 Recognize purpose and function of greenhouse

Competency 9.1.2: Prepare for propagation

Competency Builders:

- 9.1.2.1 Follow general safety precautions
- 9.1.2.2 Identify asexual and sexual plant propagation methods
- 9.1.2.3 Collect and/or obtain seeds
- 9.1.2.4 Take cuttings
- 9.1.2.5 Interpret plant and seed tag information
- 9.1.2.6 Match plant requirements to environmental conditions
- 9.1.2.7 Calculate percent germination
- 9.1.2.8 Treat seeds
- 9.1.2.9 Identify factors for determining planting rate
- 9.1.2.10 Identify factors for determining planting depth
- 9.1.2.11 Identify factors for determining planting time
- 9.1.2.12 Select containers
- 9.1.2.13 Sterilize equipment, containers, and seedbed
- 9.1.2.14 Apply propagation media principles

Competency 9.1.3: Propagate tree seedlings and cuttings

Competency Builders:

- 9.1.3.1 Follow general safety precautions
- 9.1.3.2 Stratify seeds
- 9.1.3.3 Plant seeds
- 9.1.3.4 Apply rooting hormone
- 9.1.3.5 Stick cuttings
- 9.1.3.6 Set plant spacing

Competency 9.1.4: Handle and care for seedlings and cuttings

Competency Builders:

- 9.1.4.1 Follow general safety precautions
- 9.1.4.2 Thin seedlings
- 9.1.4.3 Transplant seedlings and plugs
- 9.1.4.4 Transplant cuttings
- 9.1.4.5 Apply growth-regulating compounds
- 9.1.4.6 Prune roots
- 9.1.4.7 Lift seedlings and cuttings
- 9.1.4.8 Package plants
- 9.1.4.9 Ship plants
- 9.1.4.10 Keep nursery production records
- 9.1.4.11 Identify problems

Competency 9.1.5: Regulate nursery environment

Competency Builders:

- 9.1.5.1 Follow general safety precautions
- 9.1.5.2 Install shade cloth
- 9.1.5.3 Construct lath
- 9.1.5.4 Use light meters
- 9.1.5.5 Control humidity
- 9.1.5.6 Control temperature
- 9.1.5.7 Control moisture
- 9.1.5.8 Determine fertilizer levels

Unit 9: Forest Industry

Subunit 9.2: Forest Measurements

Competency 9.2.1: Interpret maps

Competency Builders:

- 9.2.1.1 Interpret information on topographic map
- 9.2.1.2 Interpret map legends
- 9.2.1.3 Determine distance
- 9.2.1.4 Identify sources of maps
- 9.2.1.5 Identify meridians and parallels
- 9.2.1.6 Interpret deed
- 9.2.1.7 Locate administrative land divisions
- 9.2.1.8 Identify what public records are available
- 9.2.1.9 Use United States Public Land Survey System
- 9.2.1.10 Determine direction
- 9.2.1.11 Identify natural features
- 9.2.1.12 Identify man-made features
- 9.2.1.13 Triangulate location
- 9.2.1.14 Orient map to true north
- 9.2.1.15 Use compass
- 9.2.1.16 Use city or area road map
- 9.2.1.17 Recognize use of aerial photographs
- 9.2.1.18 Interpret aerial photographs*
- 9.2.1.19 Measure horizontal distances*
- 9.2.1.20 Measure vertical distances*
- 9.2.1.21 Take area measurements*
- 9.2.1.22 Determine boundary lines*
- 9.2.1.23 Locate logging and access roads*
- 9.2.1.24 Locate dams, impoundments, ponds, and recreational-use areas*
- 9.2.1.25 Calculate slope*
- 9.2.1.26 Determine magnetic declination*
- 9.2.1.27 Recognize Best Management Practices (BMP)*

Competency 9.2.2: Cruise timber

Competency Builders:

- 9.2.2.1 Follow general safety precautions
- 9.2.2.2 Select cruise type
- 9.2.2.3 Mark timber
- 9.2.2.4 Evaluate soil conditions
- 9.2.2.5 Identify topographic features
- 9.2.2.6 Identify desirable tree species
- 9.2.2.7 Identify symptoms of internal tree problems
- 9.2.2.8 Identify symptoms of external tree problems
- 9.2.2.9 Measure tree height
- 9.2.2.10 Measure tree diameter
- 9.2.2.11 Measure basal area
- 9.2.2.12 Calculate number of trees in stand
- 9.2.2.13 Calculate stand volume in board footage and weight using Doyle and international rules
- 9.2.2.14 Calculate stumpage value
- 9.2.2.15 Calculate number of logs and sticks in tree
- 9.2.2.16 Calculate total board footage
- 9.2.2.17 Record measurements
- 9.2.2.18 Prepare inventory reports
- 9.2.2.19 Prepare stand analysis data

Competency 9.2.3: Scale pulpwood and sawlogs

Competency Builders:

- 9.2.3.1 Follow general safety precautions
- 9.2.3.2 Measure length and diameter
- 9.2.3.3 Estimate board footage using Doyle and international rules
- 9.2.3.4 Calculate volume of pulpwood
- 9.2.3.5 Calculate volume of sawlogs using various methods
- 9.2.3.6 Scale pulpwood by weight
- 9.2.3.7 Scale logs by computer*

Competency 9.2.4: Grade sawlogs

Competency Builders:

- 9.2.4.1 Follow general safety precautions
- 9.2.4.2 Observe defects
- 9.2.4.3 Identify desirable length
- 9.2.4.4 Identify clear faces
- 9.2.4.5 Identify log species

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Competency 9.2.5: Conduct survey*

Competency Builders:

- 9.2.5.1 Follow general safety precautions*
- 9.2.5.2 Clear brush*
- 9.2.5.3 Transport survey instruments*
- 9.2.5.4 Set up survey instruments*
- 9.2.5.5 Perform long-distance survey approximations*
- 9.2.5.6 Determine elevation*
- 9.2.5.7 Measure inaccessible lines*

Unit 9: Forest Industry

Subunit 9.3: Forest Establishment

Competency 9.3.1: Prepare for plant and soil testing

Competency Builders:

- 9.3.1.1 Collect soil samples
- 9.3.1.2 Prepare soil samples
- 9.3.1.3 Take plant samples
- 9.3.1.4 Prepare plant samples
- 9.3.1.5 Interpret test results

Competency 9.3.2: Prepare to plant trees

Competency Builders:

- 9.3.2.1 Follow general safety precautions
- 9.3.2.2 Calculate planting rate
- 9.3.2.3 Transport seedlings
- 9.3.2.4 Care for and store seedlings
- 9.3.2.5 Select planting site for urban and forest environment*
- 9.3.2.6 Define planting areas*
- 9.3.2.7 Plan access roads*
- 9.3.2.8 Plan soil erosion control*
- 9.3.2.9 Procure planting stock*

Competency 9.3.3: Plant trees

Competency Builders:

- 9.3.3.1 Follow general safety precautions
- 9.3.3.2 Protect planting stock
- 9.3.3.3 Prepare planting location in urban and forest environments
- 9.3.3.4 Determine factors that affect plant survival
- 9.3.3.5 Line out planting location
- 9.3.3.6 Determine planting procedure
- 9.3.3.7 Plant trees in urban and forest environments
- 9.3.3.8 Keep planting records
- 9.3.3.9 Provide care and maintenance for newly planted trees
- 9.3.3.10 Determine reclamation replant practices*

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Competency 9.3.4: Evaluate watershed management*

Competency Builders:

- 9.3.4.1 Control flood runoff*
- 9.3.4.2 Maintain soil stability*
- 9.3.4.3 Improve vegetative cover*
- 9.3.4.4 Recognize lands that may be classed as wetlands*

Unit 9: Forest Industry

Subunit 9.4: Forest Management

Competency 9.4.1: Improve timber stand

Competency Builders:

- 9.4.1.1 Follow general safety precautions
- 9.4.1.2 Describe process and function of controlled burning
- 9.4.1.3 Remove undesirable tree and brush species
- 9.4.1.4 Thin trees
- 9.4.1.5 Perform cleaning operations
- 9.4.1.6 Perform crop tree release
- 9.4.1.7 Conduct improvement cutting
- 9.4.1.8 Girdle trees
- 9.4.1.9 Prune trees

Competency 9.4.2: Fertilize trees

Competency Builders:

- 9.4.2.1 Follow general safety precautions
- 9.4.2.2 Identify symptoms of nutrient deficiency
- 9.4.2.3 Select soil amendments
- 9.4.2.4 Interpret manufacturer's fertilization-rate charts
- 9.4.2.5 Interpret fertilizer labels
- 9.4.2.6 Determine amount of fertilizer and soil amendments to apply
- 9.4.2.7 Select application method
- 9.4.2.8 Calibrate fertilizer application equipment
- 9.4.2.9 Mix fertilizer solutions
- 9.4.2.10 Apply liquid fertilizer
- 9.4.2.11 Apply dry fertilizer
- 9.4.2.12 Recognize symptoms of fertilizer injury
- 9.4.2.13 Maintain equipment
- 9.4.2.14 Keep fertilizer application records
- 9.4.2.15 Identify injection method for applying micronutrients to trees in urban forestry
- 9.4.2.16 Determine nutrient requirements*
- 9.4.2.17 Develop fertilization schedule*

Competency 9.4.3: Apply pest-control principles

Competency Builders:

- 9.4.3.1 Follow general safety precautions
- 9.4.3.2 Classify insects according to feeding habits
- 9.4.3.3 Recognize various pest damage
- 9.4.3.4 Estimate pest population numbers
- 9.4.3.5 Calculate area to be covered
- 9.4.3.6 Prepare maps of infested areas
- 9.4.3.7 Evaluate chemical/cultural/biological control options
- 9.4.3.8 Prepare pest damage samples
- 9.4.3.9 Identify common insects, diseases, and weeds*
- 9.4.3.10 Identify common vertebrate pests*
- 9.4.3.11 Assess degree of damage*
- 9.4.3.12 Determine when controls are needed*
- 9.4.3.13 Select control methods*

Competency 9.4.4: Apply chemical pest-control treatments

Competency Builders:

- 9.4.4.1 Follow general safety precautions
- 9.4.4.2 Comply with information on chemical labels
- 9.4.4.3 Calibrate application equipment
- 9.4.4.4 Mix chemicals
- 9.4.4.5 Use application equipment
- 9.4.4.6 Set out bait
- 9.4.4.7 Clean equipment
- 9.4.4.8 Recognize chemical injury
- 9.4.4.9 Maintain application record
- 9.4.4.10 Comply with government regulations
- 9.4.4.11 Follow integrated pest management (IPM) practices
- 9.4.4.12 Identify injection methods for applying pesticides to trees in urban environments
- 9.4.4.13 Comply with information on compatibility charts*
- 9.4.4.14 Select chemicals*
- 9.4.4.15 Assess treatment results*

Competency 9.4.5: Apply nonchemical pest control

Competency Builders:

- 9.4.5.1 Follow general safety precautions
- 9.4.5.2 Mow fields
- 9.4.5.3 Spread mulches
- 9.4.5.4 Till for weed control
- 9.4.5.5 Plan livestock grazing
- 9.4.5.6 Identify pest-resistant species
- 9.4.5.7 Recognize biological control products or processes
- 9.4.5.8 Follow IPM practices
- 9.4.5.9 Plant cover crops*

Competency 9.4.6: Shear Christmas trees

Competency Builders:

- 9.4.6.1 Follow general safety precautions
- 9.4.6.2 Identify purpose and response of shearing by species
- 9.4.6.3 Remove multiple leaders
- 9.4.6.4 Shear lateral branches
- 9.4.6.5 Train terminal leaders
- 9.4.6.6 Identify shearing equipment
- 9.4.6.7 Use motorized tools in shearing process
- 9.4.6.8 Maintain shearing equipment
- 9.4.6.9 Put handles on trees (i.e., remove lower branches)
- 9.4.6.10 Select type of tree taper*
- 9.4.6.11 Schedule shearing time according to species*

Unit 9: Forest Industry

Subunit 9.5: Tree Harvesting and Processing

Competency 9.5.1: Harvest nonforest trees

Competency Builders:

- 9.5.1.1 Follow general safety precautions
- 9.5.1.2 Comply with tree inspection and movement regulations
- 9.5.1.3 Dye trees
- 9.5.1.4 Dig, ball, and burlap trees
- 9.5.1.5 Cut trees
- 9.5.1.6 Tie trees
- 9.5.1.7 Bale trees
- 9.5.1.8 Identify industry standards regarding tree harvesting
- 9.5.1.9 Store trees
- 9.5.1.10 Identify options of machinery for harvesting
- 9.5.1.11 Identify market demand*
- 9.5.1.12 Schedule harvest*

Competency 9.5.2: Harvest forest trees*

Competency Builders:

- 9.5.2.1 Follow general safety precautions*
- 9.5.2.2 Plan harvest time*
- 9.5.2.3 Identify access-road requirements*
- 9.5.2.4 Design stream crossings*
- 9.5.2.5 Plan erosion control*
- 9.5.2.6 Recommend logging methods*
- 9.5.2.7 Fell tree*
- 9.5.2.8 Limb tree*
- 9.5.2.9 Cut tree into log lengths*
- 9.5.2.10 Chip tree parts*
- 9.5.2.11 Identify Best Management Practices (BMP)*
- 9.5.2.12 Identify reclamation practices*

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Competency 9.5.3: Haul wood products*

Competency Builders:

- 9.5.3.1 Follow general safety precautions*
- 9.5.3.2 Select vehicle*
- 9.5.3.3 Load logs*
- 9.5.3.4 Determine delivery route*
- 9.5.3.5 Comply with federal and state laws and regulations*
- 9.5.3.6 Prepare transport records*

Competency 9.5.4: Operate sawmill*

Competency Builders:

- 9.5.4.1 Follow general safety precautions*
- 9.5.4.2 Identify sawmill types*
- 9.5.4.3 Use hardwood sawing techniques*
- 9.5.4.4 Use softwood sawing techniques*
- 9.5.4.5 Identify knot types*
- 9.5.4.6 Identify log defects*
- 9.5.4.7 Identify basic lumber-grading techniques*
- 9.5.4.8 Identify special-use log markets*
- 9.5.4.9 Use common sawmill equipment*
- 9.5.4.10 Identify sawmill by-product uses*

Competency 9.5.5: Season lumber*

Competency Builders:

- 9.5.5.1 Follow general safety precautions*
- 9.5.5.2 Estimate expected shrinkage*
- 9.5.5.3 Choose site*
- 9.5.5.4 Build foundation*
- 9.5.5.5 Stack lumber*
- 9.5.5.6 Use stickers*
- 9.5.5.7 Pile lumber*
- 9.5.5.8 Protect piles from weather*
- 9.5.5.9 Identify lumber defects*
- 9.5.5.10 Identify techniques to protect and maintain quality of lumber*
- 9.5.5.11 Identify causes of seasoning defects*
- 9.5.5.12 Identify drying techniques*

Unit 9: Forest Industry

Subunit 9.6: Wildland Fire Operations

Competency 9.6.1: Practice wildland fire safety

Competency Builders:

- 9.6.1.1 Follow general safety precautions
- 9.6.1.2 Identify safety areas
- 9.6.1.3 Use fire shelter
- 9.6.1.4 Use protective equipment
- 9.6.1.5 Recognize situations producing explosive fire behavior
- 9.6.1.6 Identify actions for each of the letters in FIRE ORDERS
- 9.6.1.7 Identify Watch Out situations
- 9.6.1.8 Plan escape route*
- 9.6.1.9 Recognize need for Incident Command System (ICS)*

Competency 9.6.2: Suppress fires

Competency Builders:

- 9.6.2.1 Follow general safety precautions
- 9.6.2.2 Identify items that influence fire behavior
- 9.6.2.3 Construct control handline
- 9.6.2.4 Recognize man-made and natural barriers to fires
- 9.6.2.5 Recognize threats to control lines
- 9.6.2.6 Recognize types of attack
- 9.6.2.7 Identify fire triangle
- 9.6.2.8 Identify parts of fire
- 9.6.2.9 Identify and maintain hand tools
- 9.6.2.10 Recognize wildland-urban interface problems*

Competency 9.6.3: Practice mop-up operations

Competency Builders:

- 9.6.3.1 Follow general safety precautions
- 9.6.3.2 Extinguish burning materials
- 9.6.3.3 Locate hot spots
- 9.6.3.4 Use cold trailing procedures
- 9.6.3.5 Identify safety hazards

Competency 9.6.4: Identify weather conditions

Competency Builders:

- 9.6.4.1 Observe weather conditions
- 9.6.4.2 Use weather-recording instruments
- 9.6.4.3 Record weather measurements

Competency 9.6.5: Manage watering of fires*

Competency Builders:

- 9.6.5.1 Follow general safety precautions*
- 9.6.5.2 Design a hose-lay*
- 9.6.5.3 Use hose-lay appliances*
- 9.6.5.4 Inspect hoses and appliances*
- 9.6.5.5 Set up pump chase*
- 9.6.5.6 Set up collapsible tank*
- 9.6.5.7 Add surfactant to water source*
- 9.6.5.8 Practice water conservation*
- 9.6.5.9 Retrieve hose and accessories*
- 9.6.5.10 Prepare hose for transport*
- 9.6.5.11 Make and deploy hose packs*
- 9.6.5.12 Add to or replace charged hose-lay section*
- 9.6.5.13 Select and adjust pressure*
- 9.6.5.14 Use hand signals*
- 9.6.5.15 Identify foam application techniques*
- 9.6.5.16 Set up and operate pump*

Unit 9: Forest Industry

Subunit 9.7: Urban Forestry Tree Care

Competency 9.7.1: Prune trees

Competency Builders:

- 9.7.1.1 Follow general safety precautions
- 9.7.1.2 Identify and use pruning equipment
- 9.7.1.3 Maintain pruning equipment
- 9.7.1.4 Use proper pruning techniques
- 9.7.1.5 Identify effects of proper and improper pruning

Competency 9.7.2: Climb trees

Competency Builders:

- 9.7.2.1 Follow general safety precautions
- 9.7.2.2 Identify and use tree-climbing equipment
- 9.7.2.3 Tie common knots
- 9.7.2.4 Use ascending and descending techniques
- 9.7.2.5 Use working techniques in tree
- 9.7.2.6 Identify liability issues involved in tree climbing

Competency 9.7.3: Remove tree parts

Competency Builders:

- 9.7.3.1 Follow general safety precautions
- 9.7.3.2 Make removal cuts
- 9.7.3.3 Use various lowering techniques (e.g., rigging)
- 9.7.3.4 Estimate weight of tree parts by species
- 9.7.3.5 Make finish cuts
- 9.7.3.6 Identify hazardous tree conditions
- 9.7.3.7 Describe stump removal techniques

Competency 9.7.4: Dispose of debris

Competency Builders:

- 9.7.4.1 Follow general safety precautions
- 9.7.4.2 Operate and maintain chipper
- 9.7.4.3 Operate and maintain truck
- 9.7.4.4 Load tree parts
- 9.7.4.5 Describe alternative methods of debris disposal
- 9.7.4.6 Comply with government regulations regarding disposal of tree parts
- 9.7.4.7 Organize brush for disposal

Unit 10: Resource Conservation

Subunit 10.1: Resource Conservation Industry

Competency 10.1.1: Follow legal regulations

Competency Builders:

- 10.1.1.1 Follow general safety precautions
- 10.1.1.2 Identify and explain boating regulations
- 10.1.1.3 Identify and explain fishing regulations
- 10.1.1.4 Identify and explain littering regulations
- 10.1.1.5 Identify and explain swimming regulations
- 10.1.1.6 Post legal regulations
- 10.1.1.7 Identify and explain park regulations
- 10.1.1.8 Identify and explain game laws
- 10.1.1.9 Identify and explain stream, lake, pond, and groundwater laws
- 10.1.1.10 Identify and explain outdoor burning regulations

Competency 10.1.2: Identify and classify common animal species

Competency Builders:

- 10.1.2.1 Follow general safety precautions
- 10.1.2.2 Identify mammals and explain their life histories
- 10.1.2.3 Identify birds and explain their life histories
- 10.1.2.4 Identify reptiles and explain their life histories
- 10.1.2.5 Identify amphibians and explain their life histories
- 10.1.2.6 Identify invertebrates and explain their life histories
- 10.1.2.7 Identify fish and explain their life histories

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Competency 10.1.3: Examine interdependency of ecosystem

Competency Builders:

- 10.1.3.1 Identify relationship between communities of ecosystem
- 10.1.3.2 Identify major plant biomes
- 10.1.3.3 Differentiate renewable and nonrenewable resources
- 10.1.3.4 Identify communities

Unit 10: Resource Conservation

Subunit 10.2: Water Quality Management

Competency 10.2.1: Identify and assess stream dynamics

Competency Builders:

- 10.2.1.1 Follow general safety precautions
- 10.2.1.2 Identify a watershed area
- 10.2.1.3 Identify disturbances and destructive forces
- 10.2.1.4 Determine stream profile
- 10.2.1.5 Evaluate stream corridor improvement
- 10.2.1.6 Identify nonpoint source pollution
- 10.2.1.7 Measure stream velocity*
- 10.2.1.8 Measure stream volume*

Competency 10.2.2: Determine water quality parameters

Competency Builders:

- 10.2.2.1 Follow general safety precautions
- 10.2.2.2 Measure turbidity
- 10.2.2.3 Measure pH
- 10.2.2.4 Measure temperature
- 10.2.2.5 Measure dissolved oxygen
- 10.2.2.6 Profile dissolved oxygen and temperature
- 10.2.2.7 Survey macroinvertebrates
- 10.2.2.8 Identify pollution sources
- 10.2.2.9 Identify water quality indicators
- 10.2.2.10 Measure alkalinity
- 10.2.2.11 Measure residue content*
- 10.2.2.12 Measure fecal coliform count*
- 10.2.2.13 Measure phosphorus level*
- 10.2.2.14 Measure nitrate level*
- 10.2.2.15 Measure sulfate level*
- 10.2.2.16 Measure chloride level*
- 10.2.2.17 Determine water quality index*
- 10.2.2.18 Interpret water test results*

Unit 10: Resource Conservation

Subunit 10.3: Mapping

Competency 10.3.1: Conduct a basic survey

Competency Builders:

- 10.3.1.1 Follow general safety precautions
- 10.3.1.2 Measure distance
- 10.3.1.3 Use and maintain tripod level
- 10.3.1.4 Read target rod
- 10.3.1.5 Use and interpret hand signals
- 10.3.1.6 Record field notes
- 10.3.1.7 Determine allowable error
- 10.3.1.8 Calculate acreage
- 10.3.1.9 Draw a field layout
- 10.3.1.10 Locate bench mark*
- 10.3.1.11 Take backsight reading*
- 10.3.1.12 Take foresight reading*
- 10.3.1.13 Perform bench level circuit survey*

Competency 10.3.2: Interpret topographic maps

Competency Builders:

- 10.3.2.1 Follow general safety precautions
- 10.3.2.2 Identify legal descriptions
- 10.3.2.3 Identify map symbols
- 10.3.2.4 Interpret map legend
- 10.3.2.5 Determine true and magnetic north
- 10.3.2.6 Draw a profile using contour lines
- 10.3.2.7 Measure distance
- 10.3.2.8 Identify terrain type
- 10.3.2.9 Interpret elevation
- 10.3.2.10 Identify direction of water flow
- 10.3.2.11 Determine area

Competency 10.3.3: Orient to field position

Competency Builders:

- 10.3.3.1 Follow general safety precautions
- 10.3.3.2 Follow compass course
- 10.3.3.3 Locate objects in field
- 10.3.3.4 Orient compass to topographic maps
- 10.3.3.5 Adjust compass to local declination
- 10.3.3.6 Use back bearings
- 10.3.3.7 Pace out distances
- 10.3.3.8 Determine area
- 10.3.3.9 Measure distance
- 10.3.3.10 Draw field layout
- 10.3.3.11 Draw metes and bounds*

* Advancing

** Futuring

Unit 10: Resource Conservation

Subunit 10.4: Nature Interpretation

Competency 10.4.1: Demonstrate interpretive abilities

Competency Builders:

- 10.4.1.1 Follow general safety precautions
- 10.4.1.2 Lead nature hike for a group
- 10.4.1.3 Prepare an interpretative exhibit or display
- 10.4.1.4 Present an interpretive slide show
- 10.4.1.5 Present a program
- 10.4.1.6 Develop an interpretive publication
- 10.4.1.7 Lead an interpretive activity

Competency 10.4.2: Develop interpretive skills

Competency Builders:

- 10.4.2.1 Use field guides and keys
- 10.4.2.2 Operate audiovisual equipment
- 10.4.2.3 Label a scientific collection
- 10.4.2.4 Explain folklore and history of area
- 10.4.2.5 Identify target audience's level of understanding
- 10.4.2.6 Identify interpretive styles
- 10.4.2.7 Identify interpretive tools and aids

Unit 10: Resource Conservation

Subunit 10.5: Fish and Wildlife Management Awareness

Competency 10.5.1: Identify angling materials and methods

Competency Builders:

- 10.5.1.1 Identify types of rods and reels
- 10.5.1.2 Identify artificial and natural baits and lures
- 10.5.1.3 Identify habitat for nature bait
- 10.5.1.4 Identify angling types for sport fishing
- 10.5.1.5 Complete aquatic education course*

Competency 10.5.2: Identify fish management techniques

Competency Builders:

- 10.5.2.1 Follow general safety precautions
- 10.5.2.2 Identify farm pond construction and multiple-use concepts
- 10.5.2.3 Identify construction design features conducive to effective fish management
- 10.5.2.4 Identify acceptable and unacceptable farm pond species for stocking
- 10.5.2.5 Identify fish-stocking guidelines
- 10.5.2.6 Identify role of acceptable fish species to be introduced
- 10.5.2.7 Identify valued sport fish species
- 10.5.2.8 Determine acceptable level of owner management

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- 10.5.2.9 Determine owner purpose of water area
- 10.5.2.10 Identify fish harvest guidelines
- 10.5.2.11 Identify fish-sampling methods
- 10.5.2.12 Identify average age growth information for sport fish
- 10.5.2.13 Identify fish population renovation methods
- 10.5.2.14 Recognize need for population assessment of predator species
- 10.5.2.15 Recognize need to assess growth rates for predator species
- 10.5.2.16 Recognize economic importance of recreational fisheries
- 10.5.2.17 Identify fish population management practices
- 10.5.2.18 Recognize actions which would shorten recreational life of a water area
- 10.5.2.19 Locate aquatic endangered species list
- 10.5.2.20 Develop fish management plan*

Competency 10.5.3: Identify aquatic vegetative management

Competency Builders:

- 10.5.3.1 Follow general safety precautions
- 10.5.3.2 Identify owner or agency objectives of water area
- 10.5.3.3 Recognize physical, chemical, cultural, and biological vegetative control methods
- 10.5.3.4 Identify advantages and disadvantages of aquatic vegetation related to recreation
- 10.5.3.5 Apply water quality parameters
- 10.5.3.6 Determine surface area to be treated
- 10.5.3.7 Determine volume to be treated

Competency 10.5.4: Evaluate wildlife populations

Competency Builders:

- 10.5.4.1 Follow general safety precautions
- 10.5.4.2 Cruise a study area
- 10.5.4.3 Collect census data
- 10.5.4.4 Recognize recreational users
- 10.5.4.5 Define demographics
- 10.5.4.6 Assess habitat*
- 10.5.4.7 Evaluate population trends*
- 10.5.4.8 Measure mortality*

Competency 10.5.5: Identify firearm safety materials and methods

Competency Builders:

- 10.5.5.1 Follow general safety precautions
- 10.5.5.2 Identify basic archery equipment
- 10.5.5.3 Identify types of rifle actions
- 10.5.5.4 Identify types of shotgun actions
- 10.5.5.5 Identify types of sporting firearms
- 10.5.5.6 Identify basic muzzleloading equipment
- 10.5.5.7 Identify common game animals

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- 10.5.5.8 Identify common nongame animals
- 10.5.5.9 Identify reasons for game laws and seasons
- 10.5.5.10 Complete hunter education course
- 10.5.5.11 Maintain target range
- 10.5.5.12 Practice safe weapons handling
- 10.5.5.13 Identify differences between rifles and shotguns and specific ammunition types
- 10.5.5.14 Identify additional equipment necessary for hunting
- 10.5.5.15 Explain basic reloading components*
- 10.5.5.16 Plan target range*
- 10.5.5.17 Set up target range*

Competency 10.5.6: Trap mammals

Competency Builders:

- 10.5.6.1 Follow general safety precautions
- 10.5.6.2 Identify reasons for trapping
- 10.5.6.3 Identify reasons for game laws and seasons
- 10.5.6.4 Identify basic types of traps
- 10.5.6.5 Identify common animals that are trapped
- 10.5.6.6 Identify basic sets of each species trapped
- 10.5.6.7 Identify other equipment needed in trapping
- 10.5.6.8 Develop and maintain trapline
- 10.5.6.9 Complete trapper education course
- 10.5.6.10 Maintain records
- 10.5.6.11 Prepare skins for market

Competency 10.5.7: Apply animal-control techniques

Competency Builders:

- 10.5.7.1 Follow general safety precautions
- 10.5.7.2 Identify animal's behavior
- 10.5.7.3 Approach animal
- 10.5.7.4 Apply various muzzles
- 10.5.7.5 Form temporary muzzles
- 10.5.7.5 Apply pneumatic collar
- 10.5.7.7 Open mouth
- 10.5.7.8 Restrain animal's head
- 10.5.7.9 Net birds
- 10.5.7.10 Use squeeze cage
- 10.5.7.11 Use snake hood and fork
- 10.5.7.12 Operate restraining mechanisms
- 10.5.7.13 Tape legs
- 10.5.7.14 Use rodent restrainer
- 10.5.7.15 Identify animal-control purposes
- 10.5.7.16 Use small-animal carrier
- 10.5.7.17 Use rabbit restrainer
- 10.5.7.18 Use metabolism cage
- 10.5.7.19 Use shoebox cage

Competency 10.5.8: Identify wildlife management techniques

Competency Builders:

- 10.5.8.1 Follow general safety precautions
- 10.5.8.2 Identify basic reasons for wildlife management
- 10.5.8.3 Identify basic wildlife management practices for forest game, farm game, furbearers, waterfowl, and nongame species
- 10.5.8.4 Identify common animals associated with forest game, farm game, furbearers, waterfowl, and nongame species
- 10.5.8.5 Collect and prepare study skins in each category of species
- 10.5.8.6 Identify different types of capture techniques
- 10.5.8.7 Identify basic types of equipment used in wildlife management
- 10.5.8.8 Identify importance of habitat development as it relates to wildlife populations
- 10.5.8.9 Identify advantages and disadvantages of introduction of wildlife species to new habitats
- 10.5.8.10 Identify importance of healthy wildlife population to local economy
- 10.5.8.11 Identify different types of population control
- 10.5.8.12 Identify types of population density surveys
- 10.5.8.13 Identify importance of habitat evaluation and cover mapping
- 10.5.8.14 Identify carrying capacity
- 10.5.8.15 Prepare a wildlife management plan*

Unit 10: Resource Conservation

Subunit 10.6: Groundskeeping

Competency 10.6.1: Prepare media mixes

Competency Builders:

- 10.6.1.1 Follow general safety precautions
- 10.6.1.2 Mix media materials
- 10.6.1.3 Mix in media amendments

Competency 10.6.2: Prepare landscape area

Competency Builders:

- 10.6.2.1 Follow general safety precautions
- 10.6.2.2 Spread topsoil or topsoil products
- 10.6.2.3 Grade planting area
- 10.6.2.4 Apply lime and/or gypsum
- 10.6.2.5 Shape beds
- 10.6.2.6 Mark off contour*

Competency 10.6.3: Establish landscape

Competency Builders:

- 10.6.3.1 Follow general safety precautions
- 10.6.3.2 Plant seeds
- 10.6.3.3 Plant bulbs
- 10.6.3.4 Plant shrubs
- 10.6.3.5 Plant ground covers
- 10.6.3.6 Apply mulch
- 10.6.3.7 Label plants
- 10.6.3.8 Plant trees
- 10.6.3.9 Lay sod
- 10.6.3.10 Plant stolons and plugs
- 10.6.3.11 Plant hedges and screens
- 10.6.3.12 Plant annual and perennial plants
- 10.6.3.13 Dig planting hole
- 10.6.3.14 Dig up trees and shrubs with a soil ball
- 10.6.3.15 Inoculate seeds*

Competency 10.6.4: Fertilize plants

Competency Builders:

- 10.6.4.1 Follow general safety precautions
- 10.6.4.2 Interpret fertilizer bag labels
- 10.6.4.3 Mix fertilizer solutions
- 10.6.4.4 Apply fertilizer
- 10.6.4.5 Determine nutrient requirements*
- 10.6.4.6 Identify symptoms of nutrient deficiency*
- 10.6.4.7 Determine kind of fertilizer and lime to apply*
- 10.6.4.8 Compute fertilizer costs*
- 10.6.4.9 Interpret manufacturer's fertilization rate charts*
- 10.6.4.10 Determine amount of fertilizer and lime to apply*
- 10.6.4.11 Select application method*
- 10.6.4.12 Calibrate fertilizer application equipment*
- 10.6.4.13 Use fertilizer injectors*

Competency 10.6.5: Maintain landscape plants

Competency Builders:

- 10.6.5.1 Follow general safety precautions
- 10.6.5.2 Pinch plants
- 10.6.5.3 Cultivate plants
- 10.6.5.4 Water plants
- 10.6.5.5 Apply mulches
- 10.6.5.6 Disbud flowering plants
- 10.6.5.7 Wrap trees, shrubs, and vines
- 10.6.5.8 Prune trees
- 10.6.5.9 Prune shrubs
- 10.6.5.10 Prune hedges
- 10.6.5.11 Stake trees
- 10.6.5.12 Transplant bulbs, corms, and tubers

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- 10.6.5.13 Apply growth-regulating compounds
- 10.6.5.14 Thin seedlings
- 10.6.5.15 Remove old flowers
- 10.6.5.16 Maintain plants on arbors and trellises
- 10.6.5.17 Treat tree wounds*

Competency 10.6.6: Maintain trees, shrubs, and hedges

Competency Builders:

- 10.6.6.1 Follow general safety precautions
- 10.6.6.2 Climb trees
- 10.6.6.3 Cord wood to sell
- 10.6.6.4 Cut trees
- 10.6.6.5 Determine basic plant form for pruning
- 10.6.6.6 Dispose of pruned materials
- 10.6.6.7 Identify branches to prune
- 10.6.6.8 Install cables and braces
- 10.6.6.9 Prune suckers and water sprouts
- 10.6.6.10 Repair storm damage
- 10.6.6.11 Remove dead material
- 10.6.6.12 Remove girdling roots
- 10.6.6.13 Remove stumps
- 10.6.6.14 Repair bark injuries
- 10.6.6.15 Identify cause of injury*
- 10.6.6.16 Determine when to prune*
- 10.6.6.17 Identify and select bracing materials*

Competency 10.6.7: Maintain turfgrasses

Competency Builders:

- 10.6.7.1 Follow general safety precautions
- 10.6.7.2 Sprig and plug seeded areas
- 10.6.7.3 Overseed turf
- 10.6.7.4 Water turf
- 10.6.7.5 Dethatch turf
- 10.6.7.6 Fill in holes and depressions in turf
- 10.6.7.7 Mow grass
- 10.6.7.8 Edge walks and paths
- 10.6.7.9 Remove clippings and leaves
- 10.6.7.10 Compost clippings and leaves
- 10.6.7.11 Identify mowing heights
- 10.6.7.12 Develop mowing schedule*
- 10.6.7.13 Develop controlled mowing plan*

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Competency 10.6.8: Utilize pest-control program

Competency Builders:

- 10.6.8.1 Follow general safety precautions
- 10.6.8.2 Identify insects, diseases, and weeds
- 10.6.8.3 Identify public health hazards
- 10.6.8.4 Recognize pest damage
- 10.6.8.5 Complete certification requirements for prescribed chemical application
- 10.6.8.6 Interpret chemical labels and compatibility charts
- 10.6.8.7 Identify disease- and insect-resistant species*
- 10.6.8.8 Estimate pest population numbers*
- 10.6.8.9 Assess degree of damage*
- 10.6.8.10 Calculate area to be covered*
- 10.6.8.11 Determine when controls are needed*
- 10.6.8.12 Evaluate chemical/cultural/biological control options (e.g., integrated pest management [IPM])*
- 10.6.8.13 Select chemicals*
- 10.6.8.14 Compute treatment cost*
- 10.6.8.15 Map chemical application*

Competency 10.6.9: Apply chemical pest-control treatments

Competency Builders:

- 10.6.9.1 Follow general safety precautions
- 10.6.9.2 Mix chemicals and load application equipment
- 10.6.9.3 Use application equipment
- 10.6.9.4 Follow proper cleaning procedures
- 10.6.9.5 Recognize chemical injury
- 10.6.9.6 Set out bait
- 10.6.9.7 Identify application types
- 10.6.9.8 Calibrate application equipment*
- 10.6.9.9 Maintain application record*

Competency 10.6.10: Operate aquatic recreation

Competency Builders:

- 10.6.10.1 Follow general safety precautions
- 10.6.10.2 Issue boating and safety equipment
- 10.6.10.3 Place boats in water
- 10.6.10.4 Remove boats from water
- 10.6.10.5 Remove debris from water and surrounding area
- 10.6.10.6 Remove weeds from water
- 10.6.10.7 Tie boats
- 10.6.10.8 Complete basic safe boating course
- 10.6.10.9 Mount outboard engine
- 10.6.10.10 Change boat propeller
- 10.6.10.11 Conduct safety inspection
- 10.6.10.12 Install and replace safety cables and markers*

Competency 10.6.11: Establish and maintain trails

Competency Builders:

- 10.6.11.1 Follow general safety precautions
- 10.6.11.2 Lay out trails
- 10.6.11.3 Remove obstacles from trails
- 10.6.11.4 Apply wood chips
- 10.6.11.5 Construct waterbars
- 10.6.11.6 Construct steps
- 10.6.11.7 Construct bridges
- 10.6.11.8 Identify trail layout aspects
- 10.6.11.9 Identify trail types
- 10.6.11.10 Identify and mark plants*
- 10.6.11.11 Identify and mark trees*

Competency 10.6.12: Maintain roadways and sidewalks

Competency Builders:

- 10.6.12.1 Follow general safety precautions
- 10.6.12.2 Clean culverts
- 10.6.12.3 Clean and repair drainage system
- 10.6.12.4 Fill chuckholes
- 10.6.12.5 Repair bridges
- 10.6.12.6 Remove snow
- 10.6.12.7 Spread gravel
- 10.6.12.8 Grade roads
- 10.6.12.9 Maintain roadsides
- 10.6.12.10 Maintain signs
- 10.6.12.11 Identify public access requirements for special populations
- 10.6.12.12 Replace culverts*

Competency 10.6.13: Supervise and maintain camping area

Competency Builders:

- 10.6.13.1 Follow general safety precautions
- 10.6.13.2 Enforce camping rules
- 10.6.13.3 Issue camping and recreation equipment
- 10.6.13.4 Register guests
- 10.6.13.5 Provide camping information to guests
- 10.6.13.6 Plan educational programs

Competency 10.6.14: Design landscape*

Competency Builders:

- 10.6.14.1 Select and locate complements*
- 10.6.14.2 Draw plan to scale*
- 10.6.14.3 Draw landscape symbols*
- 10.6.14.4 Design public area planting*
- 10.6.14.5 Design flower garden*
- 10.6.14.6 Match plant requirements to environmental conditions*
- 10.6.14.7 Select plant and seed varieties*
- 10.6.14.8 Select containers*

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Competency 10.6.15: Prepare for landscaping*

Competency Builders:

- 10.6.15.1 Follow general safety precautions*
- 10.6.15.2 Calculate percent germination*
- 10.6.15.3 Determine planting rates*
- 10.6.15.4 Determine planting depth*
- 10.6.15.5 Determine planting time*
- 10.6.15.6 Interpret seed and bulb tag information*
- 10.6.15.7 Plan planting schedules*

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