

Teacher Assessment Blueprint

Agriculture Mechanics



Test Code: 5181 / Version: 01

General Assessment Information

Blueprint Contents

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Test Type: The Agriculture Mechanics assessment is included in NOCTI's Teacher assessment battery. Teacher assessments measure an individual's technical knowledge and skills in a proctored proficiency examination format. These assessments are used in a large number of states as part of the teacher licensing and/or certification process, assessing competency in all aspects of a particular industry. NOCTI Teacher tests typically offer both a written and performance component that must be administered at a NOCTI-approved Area Test Center. Teacher assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from subject matter experts representing the following states: Idaho, Minnesota, New York, and Pennsylvania.



01.0201- Agriculture
Mechanization, General



Career Cluster 1- Agriculture,
Food and Natural Resources



49-3041.00- Farm
Equipment
Mechanics and
Service Technicians

Written Assessment

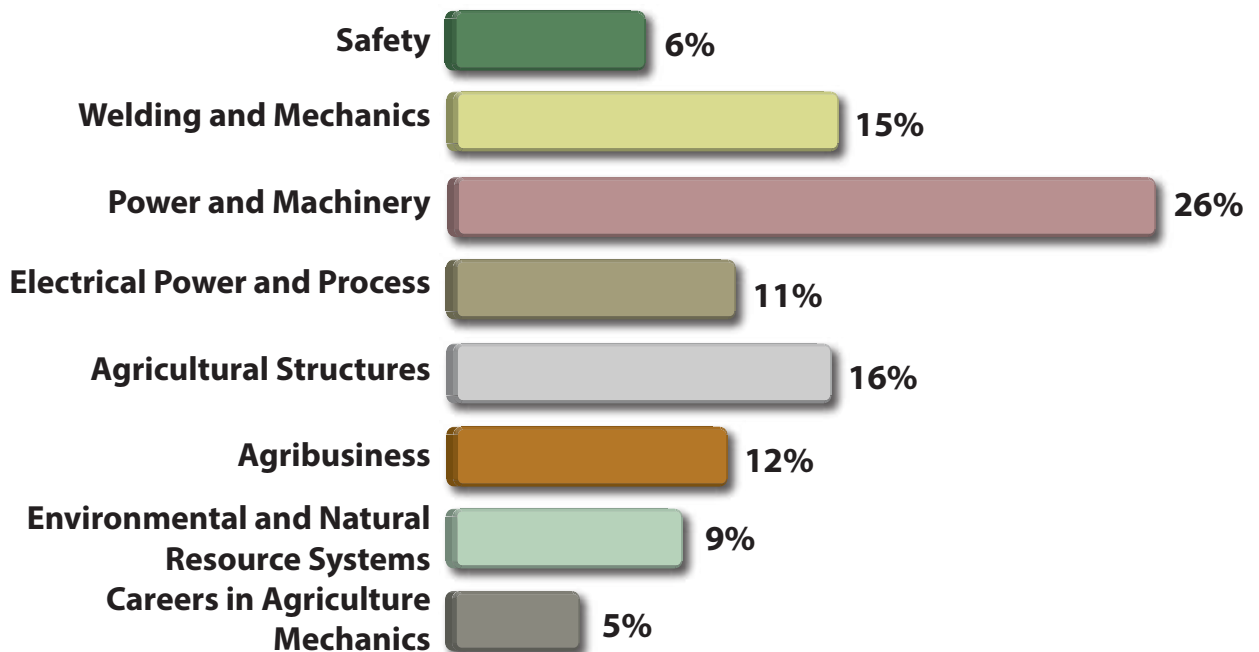
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 177

Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included in this Assessment

Safety

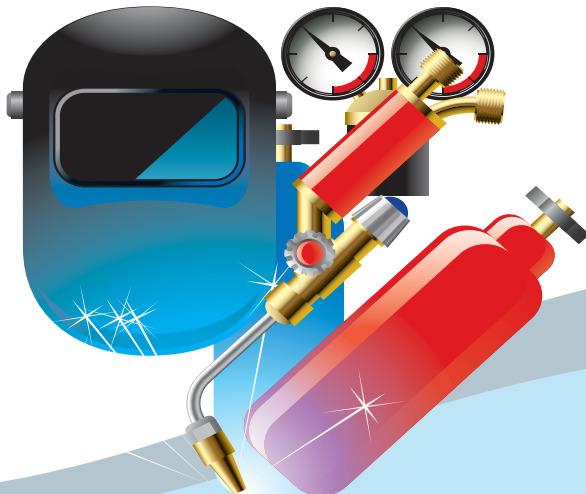
- Demonstrate positive safety attitudes and responsibilities
- Demonstrate knowledge of basic emergency procedures
- Demonstrate knowledge of equipment safety systems and consumer liability issues associated with them
- Demonstrate structural and environmental safety

Welding and Mechanics

- Exhibit knowledge and proficiency of shielded metal arc welding (SMAW) procedures
- Exhibit knowledge and proficiency of gas metal arc welding (GMAW) procedures
- Exhibit knowledge and proficiency of gas cutting and welding procedures
- Exhibit knowledge and proficiency of plastic welding procedures
- Exhibit knowledge of milling machines, lathes, grinders, and saws

Power and Machinery

- Exhibit knowledge and proficiency of fluid power system
- Exhibit knowledge and proficiency of engine system
- Exhibit knowledge and proficiency of electrical system
- Exhibit knowledge and proficiency of power train system
- Service and maintain machines and equipment
- Identify and analyze machines and equipment components
- Troubleshoot and diagnose machines and equipment
- Disassemble and reassemble machines and equipment, test operation, and make adjustments as necessary



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Specific Standards and Competencies (continued)

Electrical Power and Process

- Solve problems to determine voltage, amperage, resistances, and wattages
- Exhibit knowledge and show proficiency with use of a voltmeter, ohmmeter, ammeter, or wattmeter
- Exhibit knowledge and proficiency of structural wiring
- Disassemble, clean, and reassemble electric motors

Agricultural Structures

- Exhibit knowledge and proficiency of plumbing procedures
- Demonstrate knowledge of framing process and identify appropriate building materials
- Calculate board feet and cost of materials
- Demonstrate knowledge of concrete structures
- Read and interpret blueprints and plans
- Demonstrate knowledge of roofing systems
- Demonstrate knowledge of ventilation systems

Agribusiness

- Complete a bill of materials
- Determine cost of a project
- Accurately record and interpret nameplate information
- Calculate cost of operating equipment
- Establish and maintain effective business strategies and interpersonal communication skills
- Calculate, maintain, and analyze accurate business records
- Display knowledge of basic information management skills

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Specific Standards and Competencies (continued)

Environmental and Natural Resource Systems

- Set up and adjust field survey equipment
- Calculate, measure, maintain, and analyze data from field survey
- Complete differential or profile leveling problem
- Read and interpret maps including property, township, zoning, and topographical maps
- Demonstrate familiarity with national environmental agencies such as Natural Resource Conservation Service (NRCS), Environmental Protection Agency (EPA), or Department of Environmental Quality (DEQ)

Careers in Agriculture Mechanics

- Examine career opportunities in the agriculture power and systems technologies
- Identify advanced training or post secondary education needed for careers in agriculture power and systems technologies
- Demonstrate knowledge of personal characteristics important to specific occupations in power and systems technologies



Sample Questions

Some electric motors are designed with built-in capacitors because the capacitor

- A. gives additional starting torque even though it requires additional amperage
- B. helps maintain running efficiency after the motor reaches operating speed
- C. provides the motor with extra power when the load is increased
- D. allows the operator to set the speed of the motor

A short weld used for temporarily holding metal in place is called a _____ weld.

- A. spacer
- B. temporary fusion
- C. tack
- D. temporary braze

The control device used to regulate engine speed is referred to as the

- A. carburetor
- B. governor
- C. throttle
- D. intake valve

A square of building material will cover

- A. 10 square feet
- B. 25 square feet
- C. 50 square feet
- D. 100 square feet

A rod reading taken on a point of known elevation is

- A. backsight
- B. line of sight
- C. foresight
- D. hindsight

Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 3 hours

Number of Jobs: 6

Areas Covered:

22% Horizontal Square Groove Butt Weld – SMAW

Participants will safely execute a horizontal square groove butt weld by selecting electrodes, attaching the ground clamp, setting the correct amperage, gap, and tack, and positioning the metal correctly with a quality bead.

19% Oxyacetylene Cutting

Participants will safely adjust regulators, light, and cut using an oxyacetylene torch, and evaluate the product for accuracy.

20% Troubleshoot and Diagnose a Gas Engine

Participants will collect the engine model number, compression reading, gap measurement and spark intensity to determine and explain engine performance.

12% Install a Switch to Control a Light

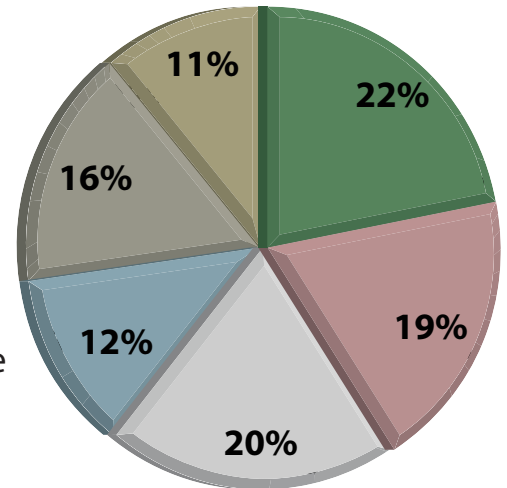
Participants will verify that the circuit and boxes are properly grounded, correctly attach the wires to the terminals, and control the light switch.

16% Mark a Common Rafter

Participants will correctly measure all specifications, mark the upper and lower plumb, and bird's mouth cuts.

11% Set-up and Instrument Leveling of the Farm Level

Participants will properly care for equipment, set up and level the instrument, and accurately record the rod reading.



Sample Job

Set-up and Instrument Leveling of the Farm Level

Maximum Time: 30 minutes

Participant Activity: The participant will be required to set up and level the instrument and take a rod reading on a road at a predetermined fixed location.

