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# **Agriculture Mechanics**

## 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

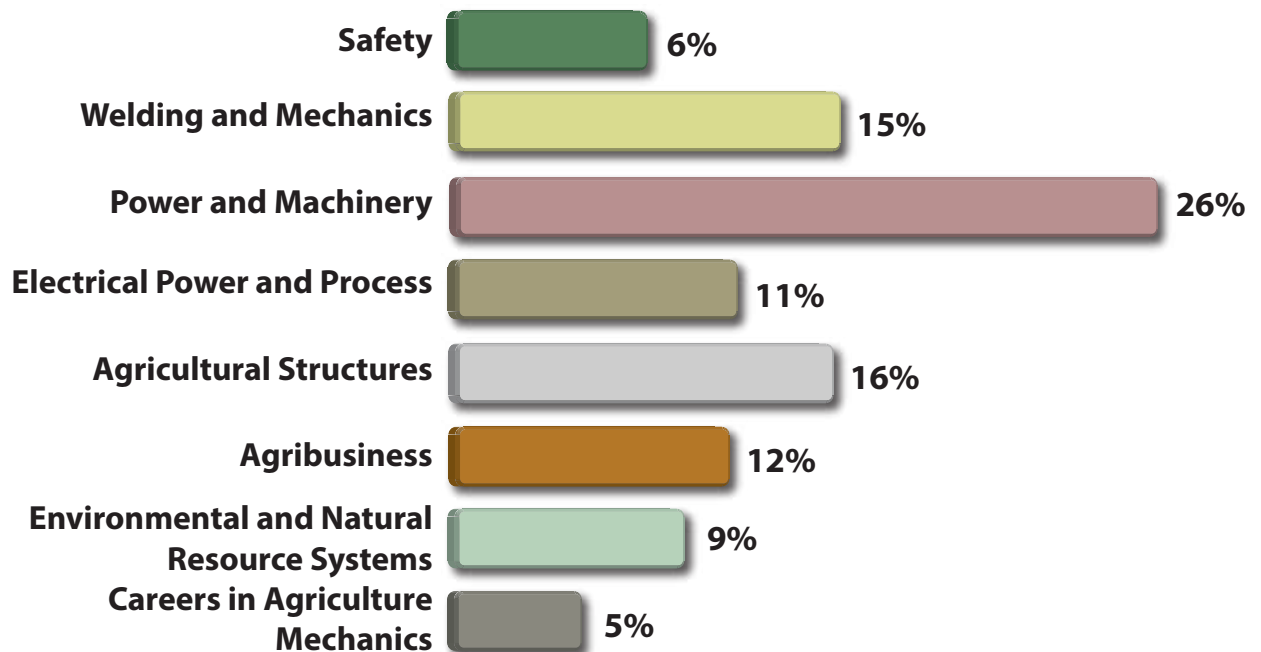
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

**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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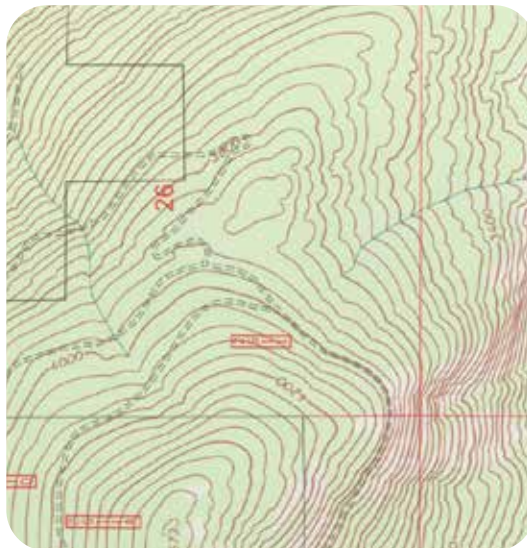
## Specific Standards and Competencies (continued)

### 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**

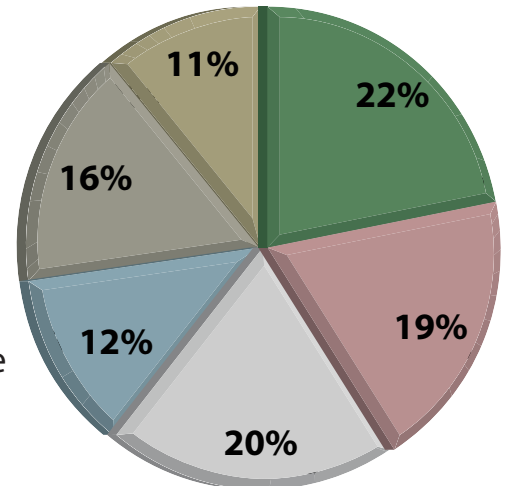
Participants will verify that the circuit and boxes are properly grounded, correctly attach the wires to the terminals, and control the light switch.

#### **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.

