North Carolina FFA Association
Agricultural Mechanics Career Development Event

Three (3) of the following Agricultural Mechanics Performance Skills will be selected for the state competition.
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 1J - Make a Butt Joint Weld in the Flat Position
Judges Instruction and Scoring Rubric

Participant Name___________________________________________________________Score________

Chapter_________________________Participant Number_________________________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of ¼" x 2" x 4" metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of ¼" x 2" x 4" metal for welding and perform the weld for grading using one electrode. The participant is to place the metal so that the butt joint is formed as a single pass weld along the 4" joint. The participant is to perform this bead weld in the flat position and is to apply the weld bead evenly to topside of both metal pieces. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

Scoring Directions:

__________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

__________ (2 points) Participant used proper eye protection at all times.

__________ (1 point) Participant used proper welding gloves.

__________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

__________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

__________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

__________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

__________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

__________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

__________ TOTAL
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 1.1J - Make a Butt Joint Weld in the Flat Position (Length to be determined by Event Official)

Judges Instruction and Scoring Rubric

Participant Name ___________________________ Score __________________

Chapter ___________________________ Participant Number ___________________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of ¼" x 2" x L" metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of ¼" x 2" x L" metal for welding and perform the weld for grading. (L" or Length in inches may vary and will be determined by the event superintendent). Multiple electrodes will usually be required to complete the weld. The participant is to place the metal so that the butt joint is formed as a single pass weld along the L" joint in the flat position and is to apply the weld bead evenly to the topside of both metal pieces. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

Scoring Directions:

__________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

__________ (2 points) Participant used proper eye protection at all times.

__________ (1 point) Participant used proper welding gloves.

__________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

__________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

__________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

__________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

__________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

__________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

__________ TOTAL

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided L" by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 1.2J - Make a T fillet Weld in the Flat Position
Judges Instruction and Scoring Rubric

Participant Name ___________________________________________ Score __________________

Chapter__________________________________________________________Participant Number ____________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of ¼” x 2” x L” metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of ¼” x 2” x L” metal for welding and perform the weld for grading (L" or Length in inches may vary and will be determined by the event superintendent). Multiple electrodes will usually be required to complete the weld. The participant is to place the two pieces of metal so the T-joint is formed and tack weld before rotating them to rest on a 45° jig so that the joint to weld is facing up in the flat position. (The event superintendent will provide the jig). The participant will weld a single pass along the L"-length of the upward facing joint, placing the bead evenly on both pieces of the metal. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

Scoring Directions:

_________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

_________ (2 points) Participant used proper eye protection at all times.

_________ (1 point) Participant used proper welding gloves.

_________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

_________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

_________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

_________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

_________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

_________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

_________ TOTAL

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided L" by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
Agricultural Mechanics Performance Skill 1.3J - Make a T fillet Weld in the Horizontal Position
Judges Instruction and Scoring Rubric

Participant Name__________________________ Score_______________
Chapter_______________________ Participant Number ____________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of ¼" x 2" x L" metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of ¼" x 2" x L" metal for welding and perform the weld for grading (L" or Length in inches may vary and will be determined by the event superintendent). Multiple electrodes will usually be required to complete the weld. The participant is to place the two pieces of metal so the T-joint is formed and tack weld before rotating them to rest on the 45° jig so that the joint to weld is facing outward in the horizontal position. (The event superintendent will provide the jig). The participant will weld a single pass along the L"-length of the outward facing joint, placing the bead evenly on both pieces of the metal. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

Scoring Directions:

_________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

_________ (2 points) Participant used proper eye protection at all times.

_________ (1 point) Participant used proper welding gloves.

_________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

_________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

_________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

_________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

_________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

_________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

TOTAL

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided L" by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
Agricultural Mechanics Performance Skill 1.4J - Make an Outside Corner Joint Weld

Judges Instruction and Scoring Rubric

Participant Name ___________________________________________________________ Score ____________________________

Chapter ___________________________________________________________ Participant Number _______________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of \( \frac{3}{4”} \times 2” \times L” \) metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of \( \frac{3}{4”} \times 2” \times L” \) metal for welding and perform the weld for grading. (L” or Length in inches may vary and will be determined by the event superintendent.) Multiple electrodes will usually be required to complete the weld. The participant is to place the metal so the outside corner joint is formed as a single pass weld along the L” joint in the flat position and is to apply the weld bead evenly to the topside of both metal pieces. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

Scoring Directions:

__________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

__________ (2 points) Participant used proper eye protection at all times.

__________ (1 point) Participant used proper welding gloves.

__________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

__________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

__________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

__________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

__________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

__________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

__________ TOTAL

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### Scoring Directions:

- **Participant used the proper welding helmet with adjustable lens or #10 shaded lens.** (2 points)
- **Participant used proper eye protection at all times.** (2 points)
- **Participant used proper welding gloves.** (1 point)
- **Participant wore proper clothing covering the entire body, including the legs.** (2 points)
- **Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.** (1 point)
- **Participant selected the proper amperage and electrode to match the metal characteristics.** (2 points)
- **Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).** (3 points)
- **Participant’s weld showed no evidence of undercutting (Defective Weld Chart).** (3 points)
- **Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).** (3 points)
- **Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).** (3 points)
- **Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).** (3 points)

**TOTAL**

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided L” by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 1.6J - Make a Lap Joint Fillet Weld in the Flat Position
Judges Instruction and Scoring Rubric

Participant Name________________________________________Score________________

Chapter____________________________________________________Participant Number _____________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety and welding equipment and the electric arc welder to perform this skill. Each participant will choose two or three pieces of ¼" x 2" x L" metal. The third piece of metal is optional and may be used for practice and to adjust welder amperage to metal characteristics if so directed by the event superintendent. (The practice metal is not required and should not be graded.) In addition, the event superintendent will either provide electrodes needed or allow participants to choose the most appropriate electrodes from choices provided.

The participant will prepare two pieces of ¼" x 2" x L" metal for welding and perform the weld for grading (L" or Length in inches may vary and will be determined by the event superintendent). Multiple electrodes will usually be required to complete the weld. The participant will perform the lap joint fillet weld in the flat position as a single pass bead along the L" joint with the bead evenly placed on the top surface of both pieces of the metal. The weld will be judged on quality, appearance, penetration and equal bead placement on both pieces of metal.

E7018 electrodes meet industry welding code requirements.

Scoring Directions:

_________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

_________ (2 points) Participant used proper eye protection at all times.

_________ (1 point) Participant used proper welding gloves.

_________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

_________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

_________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

_________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

_________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

_________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

_________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

_________ TOTAL

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided the L" by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
Scoring Directions:

__________ (2 points) Participant used the proper welding helmet with adjustable lens or #10 shaded lens.

__________ (2 points) Participant used proper eye protection at all times.

__________ (1 point) Participant used proper welding gloves.

__________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

__________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

__________ (2 points) Participant selected the proper amperage and electrode to match the metal characteristics.

__________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

__________ (3 points) Participant’s weld showed even bead placement on both pieces of metal and adequate penetration (Defective Weld Chart).

__________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

TOTAL

Since FFA advisors serve as superintendents on the Regional level or below, all chapter FFA advisors must be provided L" by email at least one month prior to Regional rally. Each advisor must ensure their email is working properly.
FILLET WELDS (T-JOINT)

FLAT POSITION

45° JIG

HORIZONTAL POSITION
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 2
Make a vertical fillet weld using the MIG welding system.
Judges Instruction and Scoring Rubric

Participant Name_________________________________________ Score ______________________

Chapter_______________________ Participant Number_______________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario
The participant will use the proper safety and welding equipment and the MIG welder and choose three pieces of 1/8” x 2” x 4” metal. The participant will use manufacturer’s recommendations to reach approximate settings for wire speed, amperage, and gas flow for the metal thickness and wire diameter being used. The participant will be provided the manufacturer’s chart and wire diameter to assist in reaching approximate settings. The participant will record the manufacturer’s recommendations on a Job Sheet, adjust to the final settings, and practice using one piece of the metal provided. (Settings can be fine tuned prior to welding by using the practice metal. The practice metal is optional and should not be graded). The remaining two pieces of metal will be placed so that a fillet joint is formed in the vertical position. The participant will perform this weld in the vertical position by placing an inside fillet weld along the 4” length joint.

Scoring Directions:

__________ (2 points) Participant used the proper welding helmet with adjustable lens or #12 or #14 lens.

__________ (1 point) Participant used proper eye protection at all times.

__________ (1 point) Participant used proper welding gloves.

__________ (2 points) Participant wore proper clothing covering the entire body, including the legs.

__________ (1 point) Participant wore proper leather closed-toe shoes that left no part of the skin or socks exposed.

__________ (1 point) Participant recorded and used manufacturer’s recommendation for proper approximate voltage.

__________ (1 point) Participant recorded and used manufacturer’s recommendation for proper approximate wire speed.

__________ (1 point) Participant recorded and used manufacturer’s recommendation for proper approximate gas flow.

__________ (3 points) Participant’s weld showed no evidence of pores and pits (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of undercutting (Defective Weld Chart).

__________ (3 points) Participant’s weld showed no evidence of excessive splatter (Defective Weld Chart).

__________ (3 points) Participant’s weld showed adequate penetration (Defective Weld Chart).

__________ (3 points) Participant’s weld was uniform in width, thickness, and appearance (Defective Weld Chart).

__________ TOTAL
Agricultural Mechanics Performance Skill 3
Sweating a Piece of Copper Pipe into a Fitting
Judges Instruction and Scoring Rubric

Participant Name ___________________________________________ Score ______________

Chapter _______________________________________________________________ Participant Number __________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario
The participant will wear the proper safety equipment for this activity. The proper tools will be selected and used to cut a piece of copper pipe according to the accompanying diagram. (Diagram and dimensions are subject to change without notice.) Once the pipe has been cut, it will then be properly prepared and sweated into a copper fitting using the provided propane torch. Upon completion, the participant will use a paint pen to identify his/her product.

Scoring Directions:

_______ (2 points) Proper clothing, gloves, and eye protection were used.

_______ (3 points) Pipe was cut to the given dimensions as shown in the accompanying diagram.

_______ (2 points) Pipe and fitting were properly cleaned in preparation for soldering.

_______ (3 points) Flux was properly applied to the pipe and fitting.

_______ (2 points) Proper procedure was used to light the propane torch.

_______ (3 points) Pipe and fitting are heated properly using the propane torch.

_______ (8 points) Solder was applied in a proper manner to the joint.

_______ (2 points) The joint was properly cooled and identified using the provided paint pen.

_______ TOTAL

\[ \text{Diagram} \]

4"

[Diagram of a piece of copper pipe and a fitting with dimensions]
North Carolina FFA Association  
Agricultural Mechanics Career Development Event  

Agricultural Mechanics Performance Skill 4  
Use a compression tester to determine if the compression for engine falls within specs.  
Judges Instruction and Scoring Rubric  

Participant Name ___________________________________________ Score ____________  
Chapter ________________________________________ Participant Number ____________  

Instructions to Judges  
You will use the rubric below to grade the participant’s skill for the scenario described.  

Scenario  
The participant will wear the proper safety equipment for this activity. The participant will select and use the proper tools to remove the spark plug, check the compression and reinstall the spark plug to the proper torque as specified by the manufacturer. (The appropriate engine manual will be provided). The participant will perform three compression tests for a provided single cylinder small engine and determine if the compression for the engine meets manufacturer’s specifications. The participant will record their findings on the Job Sheet and turn in to the judge upon completion.  

Sample Job Sheet Information  
Engine Evaluation Guide  

Engine Number ____________________  
Engine Model-Series _____________________________  
Manufacturer’s specification for compression for this engine: _____________________________  
Compression results: Test 1 _________psi  Test 2 _________psi  Test 3 _________psi  
Does engine meet required compression? _________YES _________NO  
Manufacturer’s specification for torque on spark plug ________________fp  

Scoring Directions:  

_____ (2 points) Participant selected and used proper eye protection.  

_____ (4 points) Participant selected and used proper tools to remove spark plug.  

_____ (2 points) Participant correctly identified and recorded on the Job Sheet the engine model number and manufacturer’s specification for compression.  

_____ (6 points) Participant properly used the compression tester to test engine compression three times.  

_____ (3 points) Participant recorded Test 1, Test 2 and Test 3 results on the Job Sheet.  

_____ (2 points) Participant correctly recorded on Job Sheet if engine met the manufacturer’s compression specification.  

_____ (2 points) Participant correctly recorded on Job Sheet the manufacturer’s specification for torqueing spark plug for the engine model.  

_____ (4 points) Participant selected proper tools, correctly installed and checked the torque for spark plug.  

_____ TOTAL
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 5
Remove head on L-Head engine, inspect and record piston damage, and reinstall head according to manual specifications.

Judges Instruction and Scoring Rubric

Participant Name____________________________________________________Score_________
Chapter____________________________________________________________Participant Number_________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario
The participant will wear the proper safety equipment for this activity. The participant will locate the engine model and serial number and record on Job Sheet. The participant will select and use the proper tools to remove the head on the single cylinder L-Head small engine provided, examine the piston head for damage, and record results on the Job Sheet. The participant will use the engine manual to determine torque specifications and tightening pattern and record information on the Job Sheet and engine diagram provided. (The appropriate engine manual will be provided.) Then the participant will reinstall head according to manual specifications. The participant will submit the Job Sheet to the judge upon completion.

Sample Job Sheet Information

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Engine Number</th>
<th>Engine Model-Series</th>
<th>Does piston have damage?</th>
<th>Torque Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

Diagram of L-Head cylinder:

Recommended Tightening Pattern for Judge Use

Scoring Directions:

_____ (2 points) Participant selected and used proper eye protection.

_____ (2 points) Participant recorded proper engine model and series number on Job Sheet.

_____ (1 point) Participant selected and used proper tools to remove and install head.

_____ (5 points) Participant correctly inspected and recorded on Job Sheet if engine had evidence of piston damage.

_____ (2 points) Participant recorded manufacturer’s specification for torque and tightening pattern on Job Sheet.

_____ (5 points) Participant properly installed bolts in the correct positions to reinstall the head.

_____ (8 points) Participant used the proper tightening pattern as identified on the head diagram and applied the proper torque during installation.

_____ Total
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 6
Service a small engine by checking oil level and gapping the spark plug to proper setting.

Judges Instruction and Scoring Rubric

Participant Name______________________________________________________________Score_______________
Chapter____________________________________________________________Participant Number_______________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will wear the proper safety equipment for this activity. The participant will locate the engine model and serial number and record on Job Sheet. The participant will inspect and service the small engine by checking the oil level and removing, gapping, and reinstalling the spark plug to the proper specifications. (The appropriate engine manual will be provided.) The participant will record the oil level; spark plug gap specification; and spark plug torque information on the Job Sheet and submit to the judge upon completion of the reinstallation of the spark plug.

Sample Job Sheet Information
Engine Evaluation Guide
Participant Number
Assigned Engine Number (1, 2, 3, etc.) ____________
Engine Model-Type: ________________
Oil Level: _____Full_____Low
Spark plug gap specifications according to manual: ______________
Spark plug torque specifications ________ in/lbs.

Scoring Directions:

_____ (2 points) Participant selected and used proper eye protection.

_____ (2 points) Participant recorded proper engine model and series number on Job Sheet.

_____ (4 points) Participant checked the engine for the proper oil level and recorded correctly on the Job Sheet.

_____ (3 points) Participant selected and used the proper tools to remove the spark plug.

_____ (4 points) Participant checked the engine manual for specifications on the correct spark plug gap for the given engine and plug and recorded the specifications on the Job Sheet.

_____ (4 points) Participant gapped the spark plug to proper specifications according to service manual.

_____ (6 points) Participant reinstalled the spark plug and torqued it to proper specifications.

_____ Total
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 7
Lay out and cut a round hole according to specified blueprint using a jig saw.

Judges Instruction and Scoring Rubric

Participant Name_________________________________________________________Score____________________

Chapter__________________________________________________________Participant Number_______________

Instructions to Judges

You will use the rubric below to grade the participant's skill for the scenario described.

Scenario

The participant will wear the proper safety equipment for this activity. The participant will secure a given piece of plywood lumber and the drawing provided. The participant will then measure and mark a circle on the plywood according to the dimensions provided on the drawing. After the circle has been drawn on the plywood the participant will secure and properly cut the circle out using the equipment provided. Size and placement of the circle may or may not be in the center of the board and will depend upon dimensions specified for the drawing. (See drawing below.)

A = Diameter of circle in inches
B = Vertical distance from center of circle to the edge of the board
C = Horizontal distance from center of circle to edge of the board

Scoring Directions:

_____ (2 points) Participant selected and used proper eye protection.

_____ (6 points) Participant located and drew circle on board using a compass and rule according to drawing.

_____ (5 points) Participant secured board for drilling and cutting.

_____ (6 points) Participant drilled 1/4" hole in the marked circle to start cutting procedure.

_____ (6 points) Participant cut out marked circle according to drawing dimensions and location.

_____ Total
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 8
Level transit and determine difference in elevation between two points.

Judges Instructions and Scoring Rubric

Participant Name________________________________________________________Score________

Chapter__________________________________________________________Participant Number________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario
The participant will wear the proper safety equipment for this activity. The participant will be provided a transit that is out of level. The participant will properly level the transit. Once the participant has the transit level he/she will take two elevation readings from given points and record the findings on the given Job Sheet. After determining the difference in the elevation for the two points, the participant will record the elevation difference on the Job Sheet and submit to the judge. (All readings and recordings should be to the nearest tenth of a foot.)

Scoring Directions:

_____ (2 points) Participant selected and used proper eye protection.

_____ (8 points) Participant properly leveled the tripod and instrument.

_____ (5 points) Participant properly took a reading from first identified grade stick and recorded the findings on the Job Sheet to nearest tenth of foot.

_____ (5 points) Participant properly took a reading from second identified grade stick and recorded the findings on the Job Sheet to nearest tenth of foot.

_____ (5 points) Participant determined the difference in elevation between the two points to the nearest tenth of foot and recorded the difference of the Job Sheet.

_____ Total
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 9
Construct a frame according to specified dimension using designated fasteners.

Judges Instruction and Scoring Rubric

Participant Name________________________________________Score_________________

Chapter____________________________________________________Participant Number_________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario
The participant will wear the proper safety equipment for this activity. The participant will use the provided equipment and materials to secure, mark, and cut four pieces of lumber according to drawing dimensions. Then the participant will assemble the cut pieces to form a rectangular frame using the fasteners and pattern specified on the drawing. (See the drawing below).

Length of two boards will be X” and the length of two boards will be Y”.

Scoring Directions:

_____ (2 points) Participant selected and used proper eye protection.

_____ (4 points) Participant secured and cut lumber according to drawing dimensions and design.

_____ (3 points) Participant assembled two pieces of lumber using three appropriate screws in a triangle pattern to attach X length leg to Y length leg. (Joint A)

_____ (5 points) Participant assembled third side of frame (Y length leg) using two appropriate bolts in diagonal pattern from outside corner. (Joint B)

_____ (3 points) Participant assembled last piece of lumber (X length leg) to one corner of the frame using three appropriate finish nails in a triangle pattern. (Joint C)

_____ (3 points) Participant set finish nails with proper equipment and properly applied filler to holes.

_____ (5 points) Participant assembled last corner using appropriate common nails.

_____ Total
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 10
Brazing Flat Materials in a Lap Joint
Judges Instruction and Scoring Rubric

Participant Name________________________________________________________Score_______________
Chapter____________________________________________________________Participant Number_______________

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, oxy-fuel equipment, and tools for this activity. The participant will select three pieces of 1/8" x 2" x 2" non-galvanized steel plate, one of which may be used for practice. (The practice metal is not required and should not be graded.) The participant will place two pieces of the metal so as to form a lap joint and will properly braze them together. (Brazing is to be done on one side of the metal only.)

Scoring Directions:

__________ (3 points) Participant selected and used proper eye protection at all times.

__________ (3 points) Participant wore proper gloves at all times.

__________ (4 points) Participant wore proper clothing and proper leather closed-toe shoes at all times.

__________ (3 points) Participant properly cleaned a one inch strip along one edge of each of the two pieces of metal to be used for the activity.

__________ (3 points) Participant properly placed two pieces of metal upon firebricks or other suitable material so that clean ½" strips of metal overlapped one another and formed a tight fit. (The participant may have elected to use the third piece to support the top piece or other materials to hold the two pieces in place and form a tight fit.)

__________ (3 points) Participant used the proper procedure to light and adjust the oxy-fuel torch to the neutral flame. (Regulators are to be pre-set to correct pressures.)

__________ (2 points) Participant heated the clean joint until both pieces were dull red.

__________ (4 points) Participant used a flux-coated welding rod to properly apply filler to braze the joint so that the weld showed proper capillary action by the presence of filler metal on the back edge of the joint.

__________ TOTAL
## Agricultural Mechanics Career Development Event

### Agricultural Mechanics Performance Skill 11

Properly light, adjust, use and shut down the oxy-fuel system to cut steel plate

### Judges Instruction and Scoring Rubric

**Participant Name:** ____________________________

**Score:** __________

**Chapter Name:** ____________________________________________

**Participant Number:** ______________

---

### Instructions to Judges

You will use the rubric below to grade the participant’s skill in cutting a section of 3/8” steel plate to specified dimensions (to be determined by judge) so that the finished cut exhibits the signs of a proper cut and is cut straight according to the squared soapstone mark.

---

**A. Use of proper safety equipment.** (STOP any participant who does not have proper safety equipment.)

- **(2 points)** Participant selected and used proper welding goggles with number 5 shaded lens and welding gloves.
- **(1 point)** Participant wore proper clothing and footwear to perform the activity.

**B. Adjusting Regulator Pressures – THE ORDER THAT STEPS ARE PERFORMED IN THIS SECTION DOES NOT MATTER: STUDENTS SHOULD NOT BE PENALIZED FOR THE ORDER SKILLS ARE PERFORMED IN.**

- **(1 point)** Participant opened the fuel cylinder 1/3 to 1/2 turns.
- **(1 point)** Participant opened the oxygen cylinder fully.
- **(1 point)** Participant adjusted the fuel regulator valve to about 5 pounds per square inch. (Range given varies with the tip and fuel used. May be required to check chart.) 5 pound is based on acetylene usage.
- **(1 point)** Participant adjusted the oxygen regulator valve for 10 – 20 pounds per square inch. (Range given – varies with the tip. May be required to check chart.)

**C. Lighting the Torch – THE ORDER OF STEPS SHOULD BE FOLLOWED; DEDUCTIONS INCURRED IF NOT FOLLOWED.**

- **(1 point)** Participant opened the fuel gas valve on the torch ¼ turn and lit the torch with a spark lighter.
- **(1 point)** Participant adjusted the fuel flow until the smoke cleared the flame.
- **(1 point)** Participant opened the oxygen valve on the torch and adjusted the flame to neutral (clean the tip if necessary).
- **(1 point)** Participant pressed the cutting lever and held open while readjusting to a neutral flame.

**D. Cutting steel plate with the oxy-fuel torch**

- **(1 point)** Participant used square and soapstone to properly mark the steel plate for cutting.
- **(2 points)** Participant controlled torch in the proper position to preheat steel plate.
- **(3 points)** Participant cut the steel plate maintaining proper tip clearance and speed so as to avoid a melted top edge or gouges indicating too slow travel or rough edges and incomplete cut from traveling too fast and finished with a straight, square, smoothed face cut with drag lines bending slightly backward at the bottom.
- **(2 points)** Participant’s cut was straight and too the proper dimensions per instructions

**E. Shutoff of the Torch – THIS ORDER OF STEPS SHOULD BE FOLLOWED. CONTESTANTS SHOULD BE STOPPED IF THEY FAIL TO FOLLOW THESE STEPS AND DEDUCTIONS SHOULD BE INCURRED.**

- **(1 point)** Participant turned off oxygen valve on the torch.
- **(1 point)** Participant turned off fuel gas valve on the torch.

**F. Shutdown the System and Purge the Lines – ORDER SHOULD BE FOLLOWED WITH NO PENALITY.**

- **(1 point)** Participant turned off the fuel gas cylinder valve.
- **(1 point)** Participant opened fuel gas torch valve to bleed off fuel gas line until all pressure was relieved in both gauges on regulator and then backed out the regulator adjusting screw (turned left) before closing the fuel gas torch valve.
- **(1 point)** Participant turned off oxygen cylinder valve.
- **(1 point)** Participant opened the oxygen valve on the torch and bled off the oxygen line until no pressure was indicated on either gauge on regulator and then backed out the regulator adjusting screw before closing the oxygen torch valve.

---

**TOTAL SCORE**
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 12

Wire a light fixture controlled by a single-pole switch in the middle of a run with the power coming to the light fixture first before proceeding to a duplex receptacle that will remain hot at all times.

Judges Instruction and Scoring Rubric

<table>
<thead>
<tr>
<th>Participant Name</th>
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<tbody>
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</table>

Instructions to Judges
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, nonmetallic sheathed cable, electrical devices, wire nuts, “Stacon” wire connectors (if provided), and wiring tools to properly wire a light fixture controlled by a single-pole switch in the middle of a run with the power coming to the light fixture first before proceeding to a duplex receptacle that will remain hot at all times.

Scoring Directions:

_________ (2 points) Participant selected and used proper safety equipment at all times.

_________ (2 points) Participant selected the most appropriate nonmetallic sheathed cable, devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.

_________ (2 points) Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.

_________ (4 points) Participant made ground wire connections “at the light fixture box” by twisting together three ground (bare) wires from power source, single-pole switch, and duplex receptacle with the light fixture ground and attached with the proper size wire nut or “Stacon”. If the fixture has a grounding wire screw, a grounding wire nut is used so the loose end of the ground is connected and wrapped to the light fixture grounding screw. (When wire nuts or “Stacon” wire connectors are used, an additional pigtail wire may be needed.)

_________ (2 points) Participant marked the “switch-leg” 2-wire NMS cable white (neutral) wire from the light fixture to the single-pole switch with black tape at both the switch and light fixture ends.

_________ (3 points) Participant made black (hot) wire connections at the single-pole switch by connecting and wrapping the white (black taped) wire and black wire (both are hot) from the “switch-leg” 2-wire NMS cable to the single-pole switch hot terminal screws and the ground wire to the grounding single-pole switch terminal screw.

_________ (2 points) Participant properly connected the “switch-leg” 2-wire NMS cable wire from the single-pole switch “at the light fixture” with the black (hot) wire from the single-pole switch connected to the brass terminal of the light fixture and black taped white (now hot) wire from the single-pole switch connected to all remaining black (hot) wires in the fixture box (includes power source and receptacle NMS cable hot wires).

_________ (4 points) Participant stripped approximately 3/4” from each end of 6 to 8 inch piece of white (neutral) pigtail wire, connected and wrapped one end of white (neutral) pigtail wire to the silver terminal screw on the light fixture, and properly twisted and connected the opposite end of white (neutral) pigtail wire to remaining white wires “at the light fixture box” with the appropriate wire nut (includes power source and receptacle NMS neutral wires).

_________ (2 points) Participant properly attached 2-wire NMS cable to receptacle with the black (hot) wire connected to a duplex receptacle brass terminal and the white (neutral) wire connected to a duplex receptacle silver terminal and ground wire connected to the duplex receptacle grounding screw.

_________ (2 points) Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.

_________ TOTAL
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 13
Wire a light fixture controlled by a single-pole switch with the power being first supplied to the single-pole switch. The student will include a duplex receptacle beyond the light fixture which is to remain hot at all times.

Judges Instruction and Scoring Rubric

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<thead>
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Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, nonmetallic sheathed cable (NMS Cable), electrical devices, wire nuts, “Stacon” wire connectors (if provided), and wiring tools to properly wire a light fixture controlled by a single pole switch with the power being first supplied to the single-pole switch while a duplex receptacle beyond the light remains hot at all times.

Scoring Directions:

----- (2 points) Participant selected and used proper safety equipment at all times.

----- (2 points) Participant selected the most appropriate nonmetallic sheathed cable (both two-wire and three-wire are required), devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.

----- (2 points) Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.

----- (4 points) Participant made ground wire connections “at the switch box” and “at the light fixture box” by twisting ground (bare) wires together from 2-wire NMS cable and 3-wire NMS cable and attaching the proper size grounding wire nuts so that the loose end of the grounds were wrapped and connected to the grounding screws on the single-pole switch and light fixture. (When wire nuts or “Stacons” are used, an additional 6 to 8-inch piece of ground (bare) pigtail wires may be needed to make connection to the electrical device grounding screws. In some cases, light fixtures will not have a grounding screw but a grounding wire that requires wire nutting to loose end of ground wire.)

----- (1 point) Participant made white (neutral) wire connections “at the single-pole switch box” by twisting white (neutral) wires together from 2-wire NMS cable and the 3-wire NMS cable and securing with the proper size wire nut.

----- (3 points) Participant made black (hot) wire connections “at the switch box” by twisting black (hot) wires together from 2-wire NMS cable and the 3-wire NMS cable with a 6 to 8-inch black (hot) pigtail wire and securing with the proper size wire nut so that loose end of black (hot) pigtail wire was wrapped and connected to one of (hot) single-pole switch terminal screws.

----- (2 points) Participant properly wrapped and connected one end of red wire from 3-wire NMS cable to one of (hot) single-pole switch terminals screws and the other end of red wire to the light fixture brass terminal screw.

----- (3 points) Participant made white (neutral) wires connections “at the light fixture box” by twisting together white (neutral) wires for 2-wire NMS cable from receptacle, the 3-wire NMS cable, and light fixture 6 to 8 inch white (neutral) pigtail wire and securing with the proper size wire nut so that the loose end of the white (neutral) pigtail wire was wrapped and connected to the light fixture silver terminal screw.

----- (1 point) Participant made black (hot) wire connections “at the light fixture box” by twisting together the black wire from the 3-wire NMS cable to the switch and the black wire from the 2-wire NMS cable to the receptacle securing with the proper size wire nut.

----- (3 points) Participant connected and wrapped ground wire from 2-wire NMS cable “at the duplex receptacle box” to the grounding screw on the duplex receptacle, connected and wrapped the white (neutral) wire from 2-wire NMS cable “at the duplex receptacle box” to a silver terminal screw on the duplex receptacle, and connected and wrapped the black (hot) wire from 2-wire NMS cable “at the duplex receptacle box” to a brass terminal screw on the duplex receptacle.

----- (2 points) Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.

----- TOTAL

Stacon
Nonmetallic sheathed cable
Duplex receptacle
Silver terminal screw
Brass terminal screw
Scoring Directions:

Participant selected and used proper safety equipment at all times.  
(2 points)

Participant selected the most appropriate nonmetallic sheathed cable (both two-wire and three-wire are required), devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.  
(2 points)

Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.  
(2 points)

Participant made ground wire connections at the switch boxes and at the light fixture box by twisting ground (bare) wires together from 2-wire NMS cable and 3-wire NMS cable and attaching the proper size grounding wire nuts so that the loose end of the grounds were wrapped and connected to the grounding screws on the three-way switches and light fixture. (When wire nuts or ”Staycons” are used, an additional 6 to 8-inch piece of ground (bare) pigtail wires must be used to make connection to the electrical device grounding screws. In some cases, light fixtures will not have a grounding screw but a grounding wire that requires wire nutting to loose end of ground wire.)

Participant made white (neutral) wire connections at the first three-way switch box by twisting white (neutral) wires together from 2-wire NMS power source cable and the 3-wire NMS cable to light and attaching the proper size wire nut to secure the connection.  
(1 point)

Participant connected black (hot) wire from 2-wire NMS power source cable to the common screw on first three-way switch.  
(3 points)

Participant connected 3-wire NMS cable from light to the first three-way switch by wrapping and attaching the red wire and black wire to the traveler terminal screws on the first three-way switch.  
(2 points)

Participant connected white (neutral) wire at the light fixture box by wrapping and attaching white (neutral) wire for 3-wire NMS cable from first three-way switch to the silver terminal screw on the light fixture.  
(3 points)

Participant made black (hot) wire connections at the light fixture box by twisting together and attaching the proper size wire nut to the black wire from the 3-wire NMS cable to the first switch and the hot wire (white wire coded for hot) from the 3-wire NMS cable going to the second three-way switch.  
(2 points)

Participant wrapped and connected the black (hot) from 3-wire NMS cable to the common terminal screw on the second three-way switch, wrapped and connected the hot wire (white wire coded for hot) and the red wire to the traveler terminal screws on the second three-way switch.  
(3 points)

Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.  
(2 points)

TOTAL
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 15
Wire a light fixture controlled by three-way switches when the power is first supplied to the light fixture.

Judges Instruction and Scoring Rubric

Participant Name________________________________________________________Score_______________
Chapter____________________________________________________________Participant Number_______________

(Instructions to Judges)

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, nonmetallic sheathed cable (NMS Cable), electrical devices, wire nuts, “Stacon” wire connectors (if provided), and wiring tools to properly wire a light fixture controlled by two three-way switches with the power being first supplied to the light fixture.

Scoring Directions:

_________ (2 points) Participant selected and used proper safety equipment at all times.

_________ (2 points) Participant selected the most appropriate nonmetallic sheathed cable (both two-wire and three-wire are required), devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.

_________ (2 points) Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.

_________ (3 points) Participant made ground wire connections at the switch boxes and at the light fixture box by twisting ground (bare) wires together from 2-wire NMS cable and 3-wire NMS cable and attaching the proper size grounding wire nuts so that the loose end of the grounds were wrapped and connected to the grounding screws on the three-way switches and light fixture. (When wire nuts or “Stacons” are used, an additional 6 to 8-inch piece of ground (bare) pigtail wires must be used to make connection to the electrical device grounding screws. In some cases, light fixtures will not have a grounding screw but a grounding wire that requires wire nutting to loose end of ground wire.)

_________ (1 point) Participant made white (neutral) wire connections from 2-wire NMS power source cable to the light fixture by wrapping and connecting to the silver terminal on the light fixture.

_________ (3 points) Participant made black (hot) wire connections at the light fixture by twisting together the black (hot) wire from 2-wire NMS power source cable to the white (coded for hot) wire from the 2-wire NMS cable to first three-way switch and attaching the proper size wire nut to secure the connection.

_________ (1 point) Participant connected remaining black (hot) wire at the light fixture by wrapping and attaching the black wire from the 2-wire NMS cable from the first three-way switch to the brass terminal screw on the light fixture.

_________ (1 point) Participant connected 2-wire NMS cable from light to the first three-way switch at the switch by wrapping and attaching the black wire to the common terminal screw on the three-way switch.

_________ (3 points) Participant connected white (coded for hot) wire between three-way switches by twisting and attaching white (coded for hot) wire for 2-wire NMS cable at the first three-way switch to the white (coded for hot) wire for the 3-wire NMS cable going to the second three-way switch.

_________ (2 points) Participant made white (coded for hot) wire connection from 3-wire NMS cable to the second switch by wrapping and connecting to the common terminal on the second switch.

_________ (2 points) Participant wrapped and connected the black (hot) wire and the red wire from 3-wire NMS cable between switches to the traveler terminal screws on the first and second three-way switch.

_________ (2 points) Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.

_________ TOTAL
You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, nonmetallic sheathed cable (NMS Cable), electrical devices, wire nuts, “Stacon” wire connectors (if provided), and wiring tools to properly wire two duplex receptacles so that one closest to the power source is GFCI protected while the down-line duplex receptacle is not GFCI protected.

Scoring Directions:

_______ (2 points) Participant selected and used proper safety equipment at all times.

_______ (2 points) Participant selected the most appropriate non-metallic sheathed cable, devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.

_______ (2 points) Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.

_______ (3 points) Participant made ground wire connections “at the GFCI receptacle box” by twisting ground (bare) wires together from 2-wire NMS power source cable to GFCI receptacle with 2-wire NMS cable to down-line duplex receptacle securing with the proper size grounding wire nut so that the loose end of the ground wire was wrapped and connected to the grounding screw on the GFCI receptacle. (If a grounding wire nut for grounding is not used a 6 to 8-inch piece of ground (bare) pigtail wire may be necessary).

_______ (3 points) Participant made white (neutral) wire connections “at the GFCI receptacle box” by twisting white (neutral) wires together from 2-wire NMS power source cable to the GFCI receptacle with 2-wire NMS cable to down-line duplex receptacle with a 6 to 8-inch piece of white (neutral) pigtail wire securing with the proper size wire nut so that the loose end of the pigtail wire is wrapped and connected to the silver line screw terminal on the GFCI receptacle.

_______ (3 points) Participant made black (hot) wire connections at the GFCI receptacle box by twisting black (hot) wires together from 2-wire NMS power source cable to the GFCI receptacle with 2-wire NMS cable to down-line duplex receptacle with a 6 to 8-inch piece of black (hot) pigtail wire securing with the proper size wire nut so that the loose end of the pigtail wire is wrapped and connected to the brass line screw terminal on the GFCI receptacle.

_______ (2 points) Participant made connection from 2-wire NMS to the down-line duplex receptacle by wrapping and connecting the ground wire to the grounding screw terminal on the duplex receptacle.

_______ (3 points) Participant made connection from 2-wire NMS to the down-line duplex receptacle by wrapping and connecting the white (neutral) wire to one of the silver screw terminals on the duplex receptacle.

_______ (3 points) Participant made connection from 2-wire NMS to the down-line duplex receptacle by wrapping and connecting the black (hot) wire to one of the brass screw terminals on the duplex receptacle.

_______ (2 points) Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.

_______ TOTAL
North Carolina FFA Association
Agricultural Mechanics Career Development Event

Agricultural Mechanics Performance Skill 17
Wire a GFCI receptacle with multiple-location protection.

Judges Instruction and Scoring Rubric

Participant Name____________________________________________________________ Score________
Chapter____________________________________________________________Participant Number________

Instructions to Judges

You will use the rubric below to grade the participant’s skill for the scenario described.

Scenario

The participant will use the proper safety equipment, nonmetallic sheathed cable (NMS Cable), electrical devices, wire nuts, “Stacon” wire connectors (if provided), and wiring tools to properly wire a GFCI duplex receptacle so that the down-line single-pole switch and light fixture are GFCI protected.

Scoring Directions:

__________ (2 points) Participant selected and used proper safety equipment at all times.

__________ (2 points) Participant selected the most appropriate non-metallic sheathed cable, devices, “Stacons” (connectors) and/or wire nuts to complete the assigned task.

__________ (2 points) Participant stripped approximately 3/4” from the ends of insulated wires from needed cables.

__________ (3 points) Participant made ground wire connections “at the GFCI receptacle box” by twisting ground (bare) wires together from 2-wire NMS power source cable to GFCI receptacle with 2-wire NMS cable to down-line single-pole switch securing with the proper size grounding wire nut so that the loose end of the ground wire was wrapped and connected to the grounding screw on the GFCI receptacle. (If a grounding wire nut for grounding is not used a 6 to 8-inch piece of ground (bare) pigtail wire may be necessary). Participant made ground wire connections “at the single-pole switch box” for 2-wire NMS cable from GFCI duplex receptacle and 2-wire NMS cable to the light fixture in the same way.

__________ (3 points) Participant made white (neutral) wire connection “at the GFCI receptacle box” from 2-wire NMS power source cable to the GFCI receptacle by wrapping and connecting the loose end to the silver line screw terminal on the GFCI receptacle. Participant made white (neutral) wire connection “at the GFCI receptacle box” from 2-wire NMS cable to the single-pole switch by wrapping and connecting the loose end to the silver load screw terminal on the GFCI receptacle.

__________ (3 points) Participant made black (hot) wire connection “at the GFCI receptacle box” from 2-wire NMS power source cable to the GFCI receptacle by wrapping and connecting the loose end to the brass line screw terminal on the GFCI receptacle. Participant made black (hot) wire connection “at the GFCI receptacle box” from 2-wire NMS cable to the single-pole switch by wrapping and connecting the loose end to the brass load screw terminal on the GFCI receptacle.

__________ (2 points) Participant made white (neutral) wire connections “at the single-pole switch box” by twisting white (neutral) wires together from 2-wire NMS cable to GFCI duplex receptacle and 2-wire NMS cable to the light fixture securing with the proper size wire nut.

__________ (3 points) Participant made black (hot) wire connections “at the single-pole switch box” from 2-wire NMS cable to the GFCI duplex receptacle and 2-wire NMS to the light fixture by separately wrapping and connecting the loose ends of each wire to the two brass common screw terminals on the single-pole switch.

__________ (3 points) Participant made connection “at the light fixture box” from 2-wire NMS to the single-pole switch by wrapping and connecting the black (hot) wire to the brass screw terminal on the light and the white (neutral) wire to the silver screw terminal on the light. (Sometimes connections may be made to white and black wire leads from the light fixture).

__________ (2 points) Participant checked each wire nut connection for tightness by holding the wire nut and pulling on individual wires.

________________ TOTAL