Students please affix one of your self adhesive identification labels to this space. Do not obscure other parts of this page with the label. If you do not have a self adhesive identification label, please complete the following information. Write your name as it appears on your badge.

Your Name: _____

Participation Number:

Two letter state abbreviation. → | | | | 0 | 3 | | | | 0 | |

State code (0301, 0302, …… to 0350) ↑

Team member number (01, 02, 03, or 04) ↑

Students please do not write or mark within this box.

Judges, after this skill sheet has been scored and double checked, write the total score for this activity in the blank below.

Skill Activity Score: _____

Judges Initials: _____

2014 National Agricultural Technology & Mechanical Systems Career Development Event
Plant Production Systems: Energy Systems Skill Activity

Materials Provided: Items include a partially completed wiring board with three plastic boxes mounted, a tape measure, cable rippers, diagonal cutter, needle-nosed plies, screw driver, assorted types of wire-nuts, roll of black electrical tape, and two pieces of non-metallic sheathed cable in 14-2 WG and 14-3 WG configurations. Note: *No additional cable will be provided in the event of a mistake.*

Scenario: The lamp in an on-farm storage room must be controlled from either of two entrances. A simulated wiring exercise is provided where two 3-way switches must be properly connected to operate a lamp (on and off) from two locations. Two lengths of non-metallic sheathed cable must be installed between the plastic boxes and properly connected. **Because of the limited time allowed to complete this skill exercise the connections will be made to the lamp and two switches, but the cables will NOT be secured between the boxes and they will NOT be secured were they entered each plastic box. Also, the lamp and both switches will be connected, but they will NOT be installed in the plastic boxes.** Complete this exercise as described in the following steps.

1. Only the tools and equipment provided at your work station may be used to complete the electrical wiring connections required for this skill activity. No other tools may be used.
2. Do not remove the electrical conductors that are installed in the lamp junction box when this skill activity began. They represent the incoming electrical power to the circuit and you will connect them as needed.
3. Install the appropriate electrical cable (either 4-2 WG or 14-3 WG) between the plastic lamp junction box and the nearest plastic switch box. Electrical cable will NOT be secured between boxes and will NOT be secured were it enters each plastic box. *For proper 3-way switch operation the correct cable must be selected and installed for each operation.*
4. Install the appropriate electrical cable (either 4-2 WG or 14-3 WG) between the two plastic switch boxes. For proper 3-way switch operation the correct cable must be selected and installed for each operation. Electrical cable will NOT be secured between boxes and will NOT be secured were it enters each plastic box.
5. Use the appropriate tools to remove the sheathing from that portion of each cable end that extends into a plastic box. Six inches of sheathing must be removed from each cable end that extends into a plastic box. This allows for proper switch and lamp connections. *Care must be taken not damage the black, white, and/or red insulation on the conductors or any of the copper wires while removing sheathing.*
6. Complete the appropriate electrical connections (wire splices and fixture connections) for each of the plastic boxes. A six-inch piece of bare conductor is provided if needed. Assure proper grounding connections to the switches and make sure that the black, white, and red insulated wires are properly installed/secured on terminals or secured with properly sized wire-nuts.
7. A piece of black electrical tape may be used to identify any white insulated conductors that are used as "ungrounded" conductors in these plastic boxes.

Students do not write below this line.

Item	Description of Skill Activity	Point Value	Score
1	Selection of proper cable configuration	2	
2	Outer sheathing removal from cable	5	
3	Lamp wired correctly for proper operation and grounding	7	
4	Middle box (3-way) wired correctly for proper operation and grounding	8	
5	End box (3-way) wired correctly for proper operation and grounding	8	
6	Unsafe Actions (deductions for unsafe work practices) -2 to -29	(Zero lowest score)	
		Total	

Place total in space at the top on this sheet.