

Iowa State FFA Agricultural Mechanics Career Development Event 2019

State of Iowa
Department of Education
Iowa State University
Department of Agricultural Education
and Studies

Contestant Name: _____

Contestant School: _____

Environmental and Natural Resource Systems Soil and Water Management / Surveying Skill

Use the surveying equipment provided to complete this activity.

NOTE: -1/2 point per 1" off for height, -1 point per 1° slope off, and -1/2 point per 1' off for distance.



- 1) Determine the height of Point A: _____
- 2) Determine the height of Point B: _____
- 3) Determine the height of Point C: _____
- 4) Determine the height of Point D: _____
- 5) What is the distance between Points A and B? _____
- 6) What is the distance between Points B and C? _____
- 7) What is the slope between Points A and B? _____
- 8) What is the slope between Points B and C? _____

Evaluation Score Card**Points**

	Possible	Earned
Height of Point A (-1/2 point per 1" off)	3	_____
Height of Point B (-1/2 point per 1" off)	3	_____
Height of Point C (-1/2 point per 1" off)	3	_____
Height of Point D (-1/2 point per 1" off)	3	_____
Distance (-1/2 point per 1' off)	2	_____
Distance (-1/2 point per 1' off)	2	_____
Slope (-1 point per 1° off)	3	_____
Slope (-1 point per 1° off)	3	_____
Safety procedures followed (-1 point per violation)	3	0 / 1 / 2 / 3
Total	25	_____

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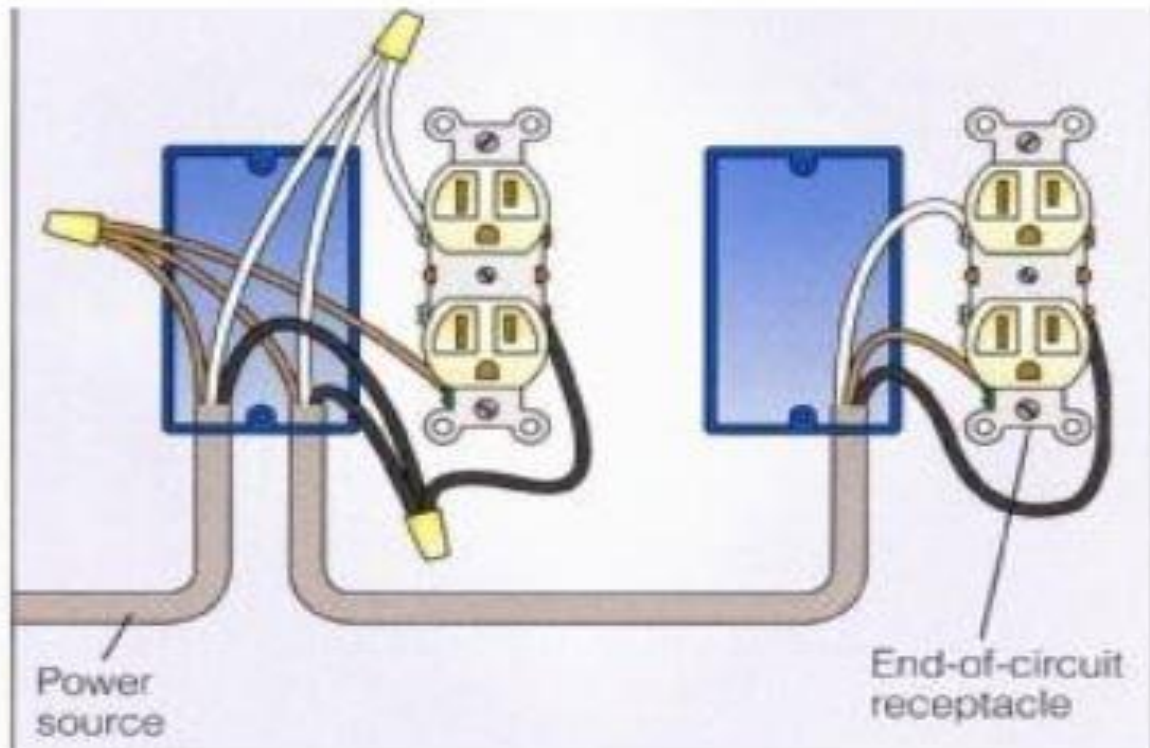
Contestant School: _____

Electrical Systems Electrical Wiring Skill

You are working to help wire up the new electrical system in a storage facility located on your employer's farm. You are responsible for wiring a storage room in the facility, where you have been asked to install two new outlets that are both continuously "hot". Using the diagram provided below, wire the electrical system using the provided materials.

NOTE: The receptacles are designed to be wired in tandem, which means that electricity passes through one (or more) middle-of-circuit receptacles to the end-of-circuit receptacle.

Please note that you will be provided with more than one option for wires and outlets.



Evaluation Score Card**Points****Possible****Earned (Circle One)**Selected the correct outlets
(-1 point per violation)

2

0 / 1 / 2

Selected the correct wires
(-1 point per violation)

2

0 / 1 / 2

Ran the neutral wires correctly
(-1 point per violation)

3

0 / 1 / 2 / 3

Ran the hot wires correctly
(-1 point per violation)

3

0 / 1 / 2 / 3

Ran the ground wires correctly
(-1 point per violation)

2

0 / 1 / 2

Wires stripped at appropriate length
(-1 point per violation)

3

0 / 1 / 2 / 3

Wires were installed in the correct direction
(-1 point per violation)

3

0 / 1 / 2 / 3

Connections are tight
(-1 point per violation)

3

0 / 1 / 2 / 3

Safety procedures followed

4

0 / 4

Total**25**

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Metals and Welding

Shielded Metal Arc Welding / Arc Welding Skill

Using the E7018 welding electrodes and two welding coupons provided, you will use the SMAW process to create a butt joint like the one shown below. **WELD ON ONLY ONE SIDE OF THE BUTT JOINT!** The welding machine has already been set up for use. You may do practice welds on the welding coupons, but not at the location of the butt joint. **DO NOT ADJUST THE MACHINE! BE SURE TO WEAR ALL OF YOUR WELDING PPE!**



Evaluation Score Card	<u>Points</u>	
	Possible	Earned (Circle One)
General appearance of weld bead	5	0 / 1 / 2 / 3 / 4 / 5
Uniform weld bead width and height	5	0 / 1 / 2 / 3 / 4 / 5
Appropriate weld bead penetration	5	0 / 1 / 2 / 3 / 4 / 5
Clean weld bead start and stop	5	0 / 1 / 2 / 3 / 4 / 5
Safety procedures followed (-1 point per violation)	5	0 / 1 / 2 / 3 / 4 / 5
Total	25	_____

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Machinery and Equipment Systems Small Engines Skill

You are a service technician working to diagnose an issue with a small gas engine used by a local landscaping business. The landscaping business operator recently brought this engine to the equipment dealership that you work at and the dealership service manager assigned you to work on this unit. The landscaping business operator provided the following information about the engine.

- The engine will no longer start properly
- The issue has been intermittent since the engine was rebuilt in another small engine dealership six months ago
- The spark plug has been tested on another engine and worked as it should
- The engine oil has been used at least 20 hours
- The gasoline was drained from the fuel tank prior to the engine being brought to the equipment dealership where you work

Based upon this information, address each of the following items as you attempt to gather information about the engine, diagnose the problem, and determine how to resolve the issue. Be sure to use the tools and service manual provided to you to help you in this activity.

1) What is the five-digit model number of the engine? _____

2) Which of these systems is the most likely cause of the engine's issue(s)? Circle one.

A) Electrical

B) Fuel

C) Compression

D) Lubrication

3) Visually inspect the engine. Which specific part is causing the issue?

4) How should the issue be resolved?

Evaluation Score Card**Points****Possible****Earned (Circle one)**

Engine model number

5

0 / 5

System-related cause of issue(s)

5

0 / 5

Part-related cause of the issue(s)

5

0 / 5

Proposed solution to resolve issue(s)

5

0 / 5

Safety procedures followed

5

0 / 5

Total**25**

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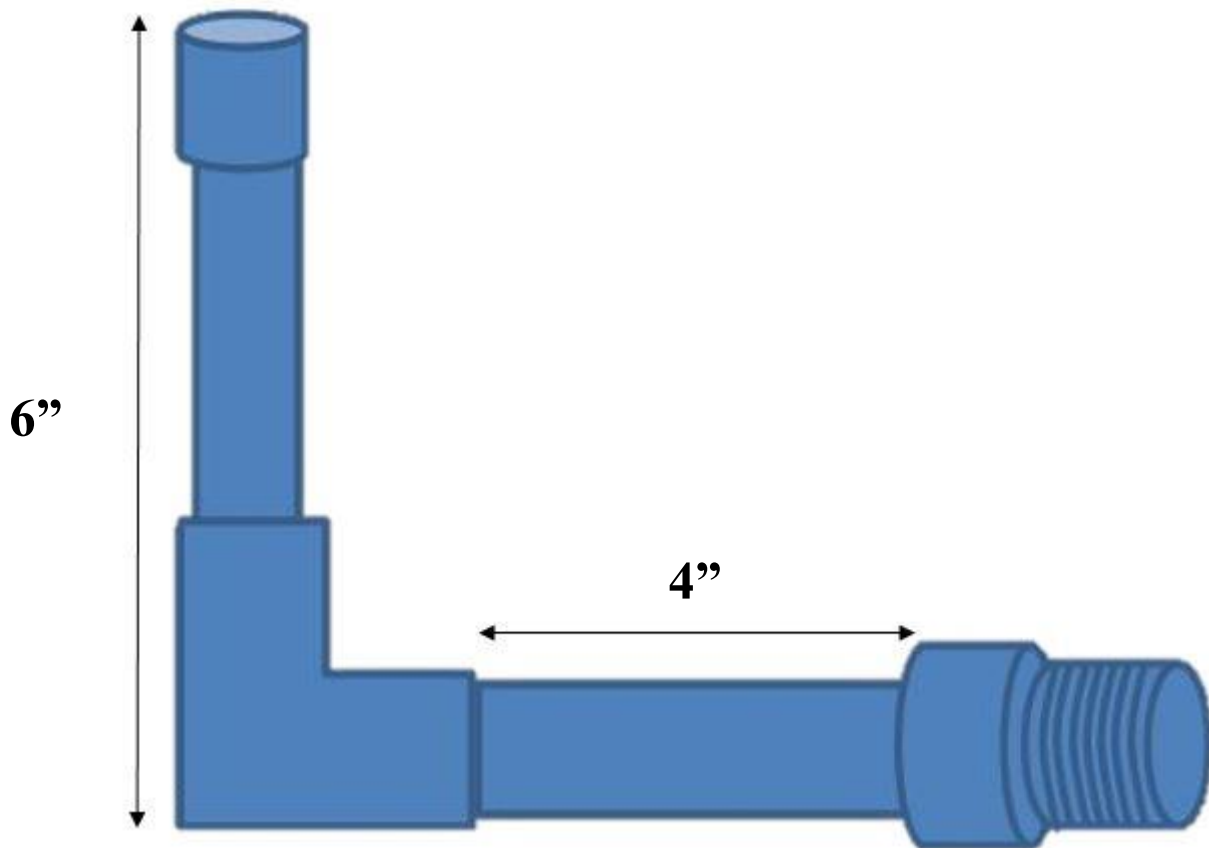
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Structural Systems

Plumbing Skill

Using the diagram below, the tools provided to you, a 12-inch piece of PVC pipe, and the three fittings (cap, elbow, and male adapter) at your station, construct the project below in accordance with the given specifications. Use primer and glue to secure each piece into each joint. Once you have completed the project below, submit your completed project to the designated table at the back of the activity area.



Evaluation Score Card**Points**

	Possible	Earned (Circle one)
Correct plumbing system configuration	2	0 / 2
Vertical piece is correct height (-1 point per 1/16" off)	4	0 / 1 / 2 / 3 / 4
Horizontal piece is correct length (-1 point per 1/16" off)	4	0 / 1 / 2 / 3 / 4
Appropriate use of primer is evident	2	0 / 2
Appropriate use of glue is evident	2	0 / 2
Holds water and does not leak	4	0 / 4
Overall quality of work (clean cuts, no excessive glue, etc.)	4	0 / 1 / 2 / 3 / 4
Safety procedures followed (-1 point per violation)	3	0 / 1 / 2 / 3
Total	25	_____