

Iowa FFA Agricultural Mechanics Career Development Event
2013

State of Iowa
DEPARTMENT OF EDUCATION
Career Education Division
Grimes State Office Building
Des Moines, IA 50319

CONTESTANT NAME _____

CONTESTANT SCHOOL _____

MACHINERY NEEDED EQUIPMENT SYSTEMS

Round Baler
Problem Solving/Skill

Instructions:

You will have 15 minutes to do this exercise. Using the sections from the owner's manual, and your knowledge of balers, answer the following questions.

I. What are the last 3 digits of: 1 pt.

a) Product (Baler) Identification Number _____

II. Identify by proper name the machine components and their function. 8 pts.

Name	Function
a) _____	_____
b) _____	_____
c) _____	_____
d) _____	_____

III. What are the lubrication intervals for the following: 6 pts.

- | | |
|-----------------------------|------------------------------|
| a) pick-up lift crank _____ | d) wheel bearings _____ |
| b) roller chains _____ | e) PTO driveline _____ |
| c) twine actuator rod _____ | f) pick-up drive idler _____ |

IV. What SAE oil viscosity is used for the gear box? _____ gear box capacity? _____ qt 2 pts.

V. What's average estimated bale weight? _____ lb 7 pts.

- What's the maximum bale diameter? _____ in.
- How much does the empty baler weigh? _____ lb
- What's the minimum recommended tractor power? _____ hp Minimum hydraulic flow? _____ gal/min
- What's the recommended tire inflation pressure? _____ psi
- How wide is a bale? _____ in.

Evaluation Score Sheet

<u>Items</u>	<u>Points</u>	
	<u>Possible</u>	<u>Earned</u>
PIN.....	1	_____
Part Identification/Function.....	8	_____
Lubrication intervals.....	6	_____
Gear box oil.....	2	_____
Bale, baler, and tractor specifications.....	7	_____
Safety.....	1	_____
Total	25	

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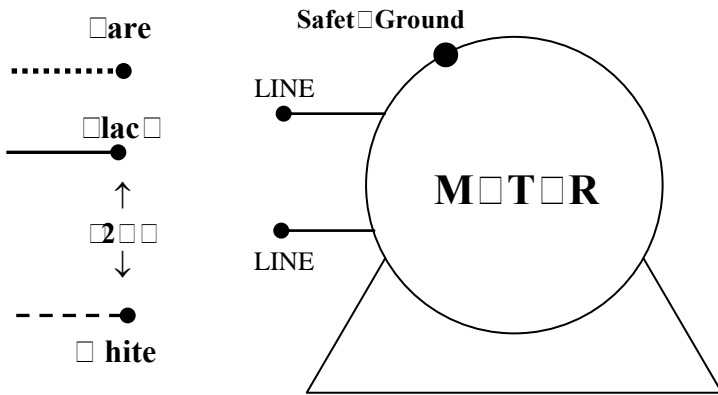
CONTESTANT SCHOOL _____

ELECTRICAL SYSTEMS
 Problem Solving/Skills
 Electrical Motors & Controls

Connecting a Motor to a Branch Circuit Cable
 (15 minutes)

All necessary materials are at the workstations.

1. Draw an appropriate wiring circuit on the graphic below using a:
 - i. solid line for the hot (black) wire
 - ii. dashed line for the neutral (white) wire
 - iii. dotted line for the safety ground (bare) wire
2. Answer the questions in the Specifications Section.
3. Connect the motor to a 120-volt branch circuit cable and safety ground the motor. Refer to the connection instructions on the motor. Use the cable clamp. Do not install the cover plate.
4. When completed, place your workstation in order and request the judge to evaluate your completed exercise.



Specifications Section

1. When viewed from the connections-end, this motor will turn (*circle one*):
 - clockwise
 - counterclockwise
 - can't tell
2. What is the full load amps specified on the nameplate of your motor when configured for 120 volts? _____ amps

<u>Items</u>	<u>Evaluation Score Sheet</u>	<u>Points</u>	
		<u>Possible</u>	<u>Earned</u>
1. Wiring Diagram		5	_____
2. Specifications and questions (3 points each)		6	_____
3. Wiring Connections			
a) Motor properly connected		8	_____
b) Wiring color code followed		3	_____
c) Cable clamp used correctly		1	_____
4. Safety and Work Habits		<u>2</u>	_____
	Total	25	<div style="border: 3px double black; width: 60px; height: 40px; margin: 0 auto;"></div>

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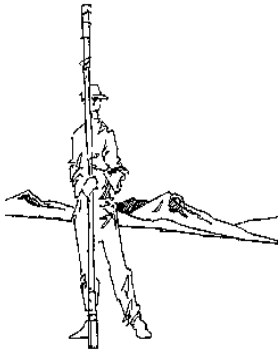
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ENVIRONMENTAL NATURAL RESOURCE SYSTEMS

Surveying

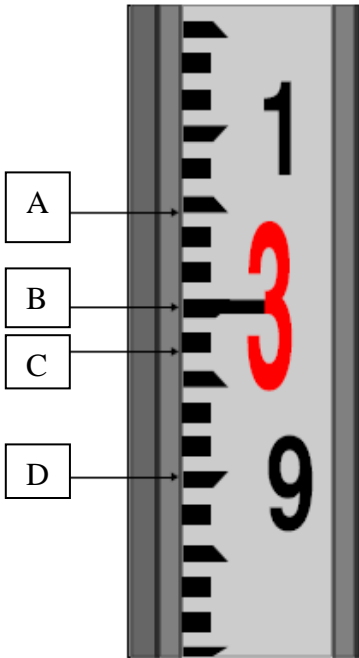
Problem Solving/Skills
(15 minutes)

Activity One: Determine Slope using the digital level and rod to complete this activity
(Three points each for height & five points for slope)



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 slope between point A & B? _____
- % slope = (change in elevation/horizontal distance) x 100

Activity Two: Reading a leveling rod (Two points each)



What is the measurement of Point A?	_____
What is the measurement of Point B?	_____
What is the measurement of Point C?	_____
What is the measurement of Point D?	_____

Evaluation Score Sheet

	<u>Possible Points</u>	<u>Score</u>
1. Height of Point A	3	_____
2. Height of Point B	3	_____
3. Height of Point C	3	_____
4. Height of Point D	3	_____
5. Slope	5	_____
6. Reading A	2	_____
7. Reading B	2	_____
8. Reading C	2	_____
9. Reading D	2	_____
Total	25	_____

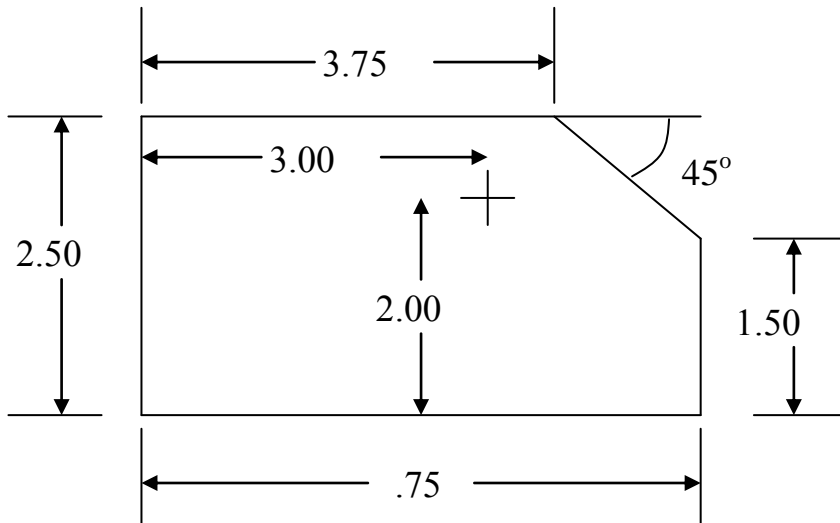
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Structural Systems
Carpentry

You will have 15 minutes to complete this activity. Using the tools and materials supplied, layout, mark and cut the project displayed below. **Use only the tool(s) provided to complete the exercise.** SAFETY GASSES ARE THE RETURN TO THE TIMES



Evaluation Score Card	Possible	Points Earned
1. Overall length of top cut (-1 per 1/16 off)	3	_____
2. Overall length of bottom cut (-1 per 1/16 off)	3	_____
3. Overall width of wide end (-1 per 1/16 off)	3	_____
4. Overall width of narrow end (-1 per 1/16 off)	3	_____
5. Angle (-1 per 5° off)	3	_____
6. location of + (-1 per 1/16 off)	2	_____
7. Quality of cuts (Squareness & Angle of cut)	6	_____
8. Safe work habits (-1 per minor violation)	2	_____
Total	25	_____

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ENERGY SYSTEMS
Problem Solving/Skill
Tractors
15 minutes

Problem Statement: When repairing a tractor, one must be able to correctly identify the parts of the tractor to successfully fix the problem. The first part of this section is parts identification. The second part is troubleshooting; you will need to identify possible causes, troubleshoot, and then describe what preventative measures would need to be taken to prevent the same problem from occurring again.

Parts Identification (2 points each) – You must go through all the tractors to find all the parts!

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Tractor Troubleshooting Scenario: (3 points each)

Your diesel tractor is experiencing a loss of power during routine work around the farm. What are **5 possible causes** that would lead to a loss of power?

- _____
- _____
- _____
- _____
- _____

Evaluation Score Sheet

<u>Items</u>	<u>Points</u>	
	<u>Possible</u>	<u>Earned</u>
1. Parts Identification	10	_____
2. Troubleshooting	15	_____
Total	25	<div style="border: 1px solid black; width: 60px; height: 30px; display: inline-block;"></div>