



Georgia FFA Association

LAWN MOWER OPERATIONS – MIDDLE SCHOOL CDE

I. OVERVIEW

The Middle School Lawnmower and Equipment Operations & Maintenance Contest is an individual event, with three parts.

1. The contestant will answer questions on a written exam dealing with lawnmower and equipment operations, maintenance, and safety.
2. The contestant will have to determine the problem and the best solution to the problem in ten problem solving questions.
3. The contestant will have a practical driving test where he/she will exhibit his/her skills in driving a lawnmower and equipment through a designed course.

II. PURPOSE

The Middle School Lawnmower and Equipment Operations & Maintenance Contest is designed to develop skills in operating lawnmowers and various pieces of equipment safely, as well as maintaining the mower and equipment in a safe and productive matter.

III. ELIGIBILITY

This event is open to students in grades 6-8 who are agricultural education students, and are paid members of a chartered FFA chapter. Each student's name must appear on the chapter's FFA roster at least 10 days prior to competition above the chapter level.

. *Chapters are limited to one (1) CDE contestant per chapter.*

IV. SPECIAL NEEDS REQUEST

To report any special needs or request special services for a student to compete in a Career Development Event or FFA Award area (Area or State level), it is the responsibility of the FFA advisor to provide a detailed and specific request and explanation in writing. Requests should include written documentation from the school system verifying the IEP and need being requested. Written requests must be submitted to the CDE Superintendent prior to registering for the CDE/event (at least 3 weeks prior to the date of competition.)

V. RULES

The following rules will govern the driving:

1. Time begins when the mower crosses the start/finish line.
2. Time ends when the mower crosses the start/finish line.
3. No one will be allowed in the career development event area except the contestant and officials.
4. Safety violations will be noted by the judges. Three safety violations will disqualify the contestant at the discretion of the judges. **Safety is recognized as of the utmost importance.**
5. Course layout will be printed in the bulletin.
6. A lawnmower of a like model will be available for practice and acclimation

VI. EVENT FORMAT

The CDE will consist of three parts:

Part I – Written Exam – 20 Points. Contestants will *have 30 minutes to* answer **twenty** multiple-choice questions on lawnmower servicing, safe operation, care, and maintenance.

Part II – Problem Solving – 20 Points. Contestants will *have 30 minutes to* answer **ten** multiple-choice problem solving activities relating to lawnmower servicing, safe operation, care and maintenance.

Part III – Lawnmower Maintenance/Driving – 60 Points. Contestants will be asked to name the listed **Daily Maintenance/Safety Checks** listed on the score sheet before Operating Mower. Contestants will *Have 5 minutes* to complete the driving course without time penalty. *Contestants will have a maximum of 5 minutes to navigate the course. Time will be stopped after ten (10) minutes and the contestant will be scored as a Zero (0) for incomplete.*



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The following lawnmower operations will be graded:

- A. Explaining pre-warm up procedure. (**Daily Maintenance/Safety Checks**).
 - B. Checking mowing height (height to be determined by the judge).
 - C. Pulling out of the **Lawnmower Shed** which is represented by lines of stakes, not more than **(2') two feet** apart with **(6") six inch clearance** on each side of the widest point of the mower deck **including Discharge Chute Assembly...**
 - D. **Backing** the Lawnmower into the **Equipment Shed** which is represented by lines of stakes, not more than (2') **two feet** apart with **(6") six inch clearance** on each side.
- E. Attaching equipment (a two-wheeled implement) to the lawnmower.
 - F. Pulling the implement out of the **Equipment Shed**.
 - G. Pulling the implement through a set **Alley** lined with stakes not more than **(2') two feet** apart with **(9") nine inch clearance** on each side of the widest point of the mower deck **including Discharge Chute Assembly**, or the diagonal width of the mower determined by the diagonal width measured from the center of the inside front wheel to the outside center of the opposite rear wheel + 18 inches, whichever is the largest measurement. Two five gallon buckets, two barrels, or two automobile tires will be placed in the course so that the contestant will have to circle each, as if they were mowing around trees, before returning the mower to the equipment shed. These objects will be set apart determined by the diagonal width, or the mower deck width including the discharge whichever is larger. Markers from the buckets, barrels, or tires will be set at the same width apart.
- H. Returning the implement to the **Equipment Shed**.
- I. Unhooking the implement and **Backing** the Lawnmower to the **start/finish line**.

**** For safety of participant and bystanders, the blade will not be engaged at any time during the driving portion of the event! Engaging the blade will result in Safety Penalty Points.**

VII. SCORING

Part I – Written Exam – 20 Points (Each correct answer counting 1 point).

Part II – Problem Solving – 20 Points (Each correct answer counting 2 points).

Part III – Lawnmower Driving – 60 Points (Refer to the driving score card that is attached).

*Pre-Warm Up:

- 1. Failure to check:
 - a. Engine oil level _____ 40 points
 - b. Air filter _____ 30 points
 - c. Engine cooling system _____ 30 points
 - d. Belt tension and wear _____ 10 points
 - e. Air Pressure in tires _____ 20 points
 - f. Fuel level _____ 10 points
 - g. Wheel lugs _____ 10 points
 - h. Battery Condition _____ 10 points
 - i. Cutting Blades _____ 30 points
 - j. Safety equipment _____ 20 points

Safety Equipment (Brake lock, Discharge Chute Assembly, Safety Starting Switches-(Seat, PTO, Backup), Belt Shields.

*These practices will be in the form of a visual check up with the contestant explaining to the judge (s) how each is accomplished in detail.



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2. Driving Lawnmower
 - a. Efficient completion of skill – One point deducted for each second over 300 seconds (5 minutes).
 - b. Attempting to crank the lawnmower with safety switch engaged – number of times X 10.
 - c. Stalling engine- number of times X 10
 - d. Excessive engine speed (RPM's) X 10
 - e. Pull-ups and back-ups to improve position – number of times X 10.
 - f. Markers scraped – number of times X 20.
 - g. Markers moved or upset – number of times X 40.
 - h. Failure to select suggested **deck height**- number of times X 10.
 - i. Improper use of clutch- number of times X 10.
 - j. Operating mower in improper direction- number of times X 20.
 - k. Number of inches lawnmower wheels off center in Equipment Shed – number of times X 20.
 - l. Number of inches lawnmower wheels off center in Lawnmower Shed – number of times X 20.

3. Safety measures when driving lawnmower
 - a. Excess speed when turning and driving – number of times X 40.
 - b. Mounting/Dismounting lawnmower improperly - number of times X 20.
 - d. Failure to kill or shut engine off when dismounting- number of times X 100.
 - e. Failure to applying parking brake when dismounting- number of times X 100.
 - f. Releasing brake before starting- number of times X 20.
 - h. Mower Deck (Blades) Engaged – number of times X 100.
 - j. Failure to use hearing protection – number of times X 20.
 - k. Failure to use eye protection – number of times X 20.

VIII. TIE BREAKERS

In the event of a tie in the overall CDE, the contestant with the highest driving score will be declared the winner. Second tie breaker will be the contestant with the highest problem solving score, while third tie breaker will be the contestant with the highest written exam score.

IX. AWARDS

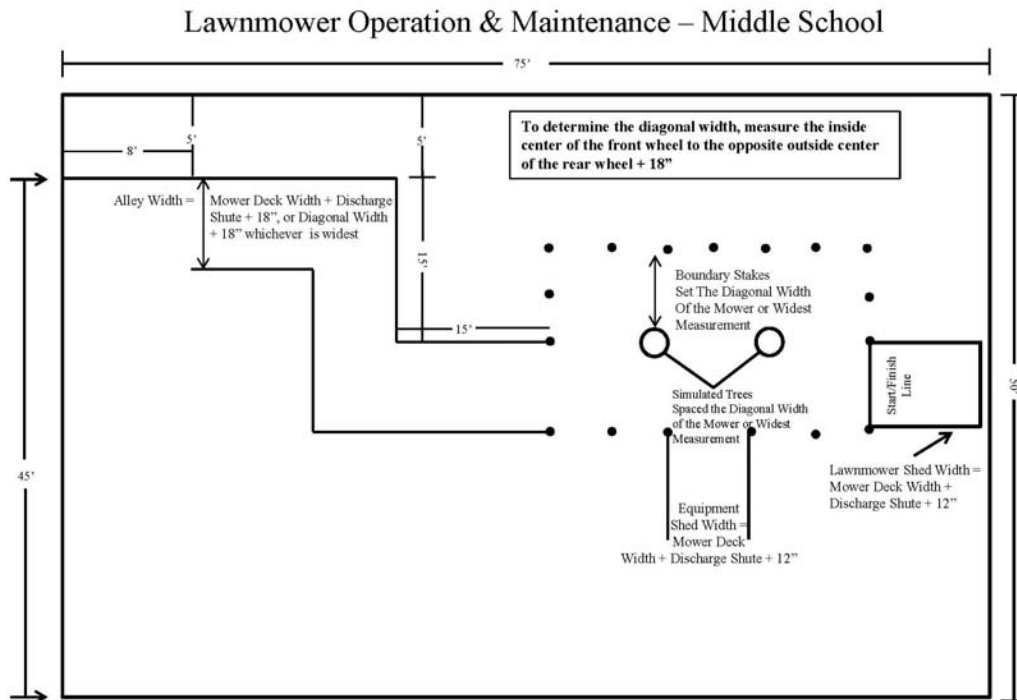
Awards shall be determined each year by the **Agriculture Education Office**. First and Second Place Winners from each Area will be presented a plaque at the appropriate **Area award ceremony**.



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X. COURSE LAYOUT

MIDDLE SCHOOL FFA LAWNMOWER COURSE LAYOUT





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Steps- Setting Up Course

1. Lay off boundary of driving course squared at **(50') fifty feet** by **(75') seventy five feet**.
2. Set up Alley according to drawing with width of alley set to the **width of the mower deck with discharge chute down plus (18") eighteen inches or width of the mower deck + discharge chute + 18", whichever is widest.**
3. Extend Alley line from point "A" to point "B" at least (3) three times the **Diagonal Width plus the width of the tires.**
4. Set up tires simulating trees between points "A" and "B".
 - The distance from point "A" to the outer edge of the first tire should be set at the **Diagonal Width plus 18 inches.**
 - The distance from the first tire to the outer edge of the second tire should be set at the **Diagonal Width plus 18 inches.**
 - The distance from the second tire to the boundary at point "B" should be set at the **Diagonal Width plus 18 inches.**
5. **Lawnmower Shed Setup**
 - The Depth of the Lawnmower Shed should be set from point "B" the **length of the lawnmower.**
 - The Width of the Lawnmower Shed should be set from point "B" the **width of the mower deck with chute down plus (12") twelve inches.**
 - The back end of the Lawnmower Shed should be closed.
5. **Equipment Shed Setup**
 - Measure the distance from point "A" to the outside edge of the first tire (**edge closest to point "B"**).
 - Measure along the outer boundary line opposite the tires the same distance. This will be the outer edge of the Equipment Shed.
 - The depth of the shed should be the **length of the lawnmower plus the implement.**
 - The Width of the Lawnmower Shed should be set the width of the implement tires outside to outside plus (12") twelve inches
 - Both ends of the Equipment shed should be open.

Steps- Driving Course

1. Contestant will name **Pre-Operational Maintenance and Safety Checks** before Operating Mower.
2. At **Start/Finish Line** located at the **Lawnmower Shed-Crank** Mower, Select Gear and Speed, Select stated blade (deck) height and proceed to **Equipment Shed (see blue line-drawing)**
 - Contestant may briefly operate mower behind Start/ Finish line without penalty. Questions about machine operation need to be asked at this point before starting.
 - Time begins when front tires cross start/finish line.
 - **Penalty Points will be assessed for each marker upset or scraped while driving the entire course.**
 - A marker is considered scraped when it has been touched by any part of the mower. An "upset" will be considered as moving a marker from its station.
3. Back mower into **Equipment Shed (see blue line-drawing)**
 - Back into **Equipment Shed** to hook up two wheel **Equipment** located in the Shed.
 - Penalty Points will be assessed if Mower **Stalls due to controls not being disengaged before backing**
 - **Lock the Mower Brakes before exiting Mower**
 - Exit Mower Safely (**On Left Side- Do not step on deck**)
 - ✓ Mower must be **manually shut off with Key** when exiting to hook up equipment
 - **Do not depend on the seat safety switch or you will be assessed penalty points**



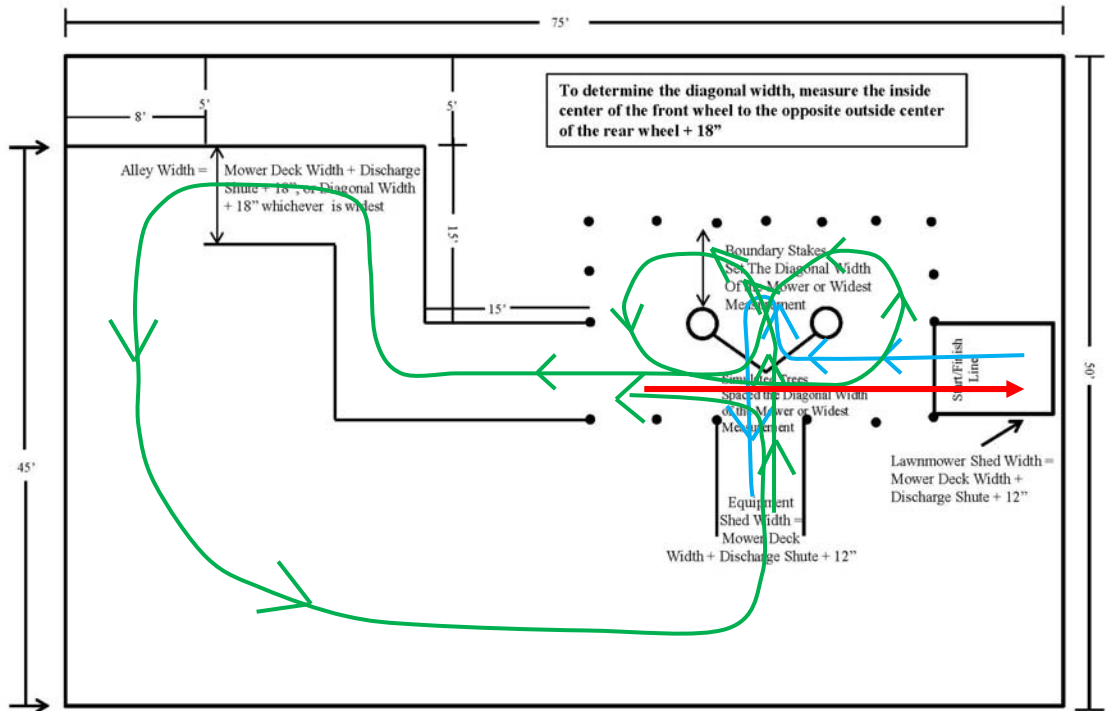
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- Hook up equipment provided to Mower **with pull pin provided.**
 - Mount Mower Safely (**On Left Side- Do not step on deck**)
 - **Crank Mower** and select gear
 - ✓ **Attempting to Crank Mower with any safety switch engaged (PTO, Forward/Reverse Gear) will result in penalty points**
 - Exit the **Equipment Shed** with the **Equipment in Tow** (see green line-drawing)
4. Navigate Mower and equipment around the simulated trees in a **counterclockwise** rotation and proceed into **Alley.** (see green line-drawing). Failure to mow around trees with chute throwing grass away from the “tree” will result in penalty points.
5. Negotiate **Alley** with mower and equipment. (see green line-drawing)
6. Upon Exit from **Alley.** Proceed to **Equipment Shed.** (see green line-drawing)
7. Pull mower and equipment into **Equipment Shed,** stopping at point determined by Judge for **measurement to equipment tires.** (see green line-drawing)
- **Equipment Wheels should be centered in Barn.**
 - **Penalty Points will be assessed for every inch off center.**
 - Mower may be backed up to center wheels, but penalty points for **pulling up/backing up** will be assessed.
 - **Lock the Mower Brakes before exiting**
 - Exit Mower Safely (**On Left Side- Do not step on deck**)
 - Mower must be **manually shut off with** when exiting to hook up equipment
 - ✓ Do not depend on the **seat safety switch** or you will be assessed penalty points
 - **Unhook the Equipment**
 - ✓ Leave **Pull Pin** on Ground Beside Equipment Tongue
8. Exit the **Equipment Shed** and ***back*** the **Mower only** into the **Lawnmower Shed** at the **Start/Finish Line.** (see red line-drawing)
9. Time **ENDS** when **front tires** cross **Start/Finish Line with machine backing.**
- If machine is not backed into proper position, the contestant will be asked to correct the mistake by pulling out and backing in resulting in loss of time.



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XI. REFERENCES

Texts

Small Engines by R. Bruce Radcliff (Authorized by Briggs & Stratton), Second Edition, 2004, American Technical Publishers. ISBN 978-0-8269-0012-8

John Deere – Fundamentals of Compact Equipment Series

Compact Equipment: Safety Management for Landscapers, Grounds-Care Businesses and Golf Courses. A primer of safety procedures for compact or outdoor power equipment. Book © 2001

Compact Equipment: Engines. A primer of test and repair procedures for compact-equipment engines.

http://www.deere.com/en_US/compinfo/publications/john_deere_publishing/complete.html

Turfgrass Science and Management by Robert Emmons, Second Edition, 1995, Delmar Publishers. Chapter 11. Mowing

http://www.delmarlearning.com/Browse_CatalogDetail_Print.aspx?xxID=27423&isbn=1418013307

AAVIM – All Machinery Related Publications

Lawnmower Operators Manuals (the following list is only examples not intended to be comprehensive!)

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03502.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03537.pdf>

<http://www.troybilt.com/wcsstore/pics/TroyBilt/769-03532.pdf>

<https://www.managemyhome.com/mmh/user-profile/CreateUserProfileDisplay.action?> Sears Craftsman Manuals

http://www.usa.husqvarna.com/support_manual_search.aspx

<http://www.snapper.com/manuals/#>

<http://www.exmark.com/Manuals.htm>

http://www.usa.husqvarna.com/support_manual_search.aspx/landscapers.aspx

<http://www.snapper.com/manuals/#> Select Z Rider

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

<http://www.dixiechopper.com/support.php>

http://manuals.deere.com/cceomview/OMM157372_H7/Output/Index.html

Lawnmower Engine Manufacturers Service and Repair Manuals

Lawn Equipment Operators Manuals

Lawnmower Dealer Brochures

X. OTHER HELPFUL INFORMATION

Lawn Equipment Videos

http://www.deere.com/en_US/homeowners/safety/video.html?tm=ho&link=cnav

<http://www.dixiechopper.com/support.php>

Safety/Maintenance Publications

http://www.deere.com/en_US/homeowners/safety/mowermaintenance.html?aid=

http://www.grounds-mag.com/news/mowers_052606/

<http://msucare.com/pubs/publications/p1097.pdf>

<http://www.toro.com/safety/index.html>

http://www.cdc.gov/nasd/menu/topic/machinery_mowers.html

<http://www.nsc.org/resources/issues/agrisafe.aspx>



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CONTESTANT # _____	NAME _____	CHAPTER _____	TIME _____	
PRE-WARM UP			NO. TIMES	TOTAL POINTS
Failure to Check:				
A. Engine oil level			X 40	
B. Air filter			X 30	
C. Engine Cooling System			X 30	
D. Belt Tension and Wear			X 10	
E. Air Pressure in tires			X 20	
F. Fuel Level in Tank			X 10	
G. Wheel Lug tightness			X 10	
H. Battery Condition (Posts- Electrolyte level)			X 10	
I. Safety Equipment (Brake lock, Discharge Chute Assembly, Safety Starting Switches-(Seat, PTO, Backup), Belt Guards.			X 20	
DRIVING LAWNMOWER				
1. Efficient completion of skill - No. seconds over 300			X 1	
2. Attempting to crank lawnmower with safety kill switch engaged			X 10	
3. Stalling Engine			X 10	
4. Excessive engine Speed (RPM's)			X 10	
5. Pull-ups & backups to improve position (No. times)			X 10	
6. Markers scraped (Number)			X 20	
7. Markers moved or upset (Number)			X 40	
8. Failure to select suggested deck height			X 10	
9. Improper use of clutch (No. times)			X 10	
10. Operating mower in the improper direction			X 20	
11. Number of inches wheels off-center in <u>Equipment shed</u>			X 10	
12. Number of inches wheels off-center in <u>Lawnmower Shed</u>			X 10	
<u>SAFETY</u>				
1. Excess speed when turning & driving (No. times)			X 40	
2. Mounting /Dismounting lawnmower improperly (No. times)			X 20	
3. Failure to *kill engine with key when dismounting (No. times)			X 100	
4. Locking brakes when dismounting (No. of failures)			X 100	
5. Unlocking brakes before starting (No. of failures)			X 20	
6. Mower Deck (Blades) Engaged			X 100	
7. Failure to use hearing protection			X 20	
8. Failure to use eye protection			X 20	

Total Penalty Points
60- NO. OF PENALTY POINTS X 60 = DRIVING SCORE
100



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