2024 Minnesota State Fair FFA Live Agricultural Mechanics Competitions

Aug. 30 - Small Engines Build Off @ the Big Ideas Tent
Aug. 31 - Wood Construction Build Off @ Ag Technology hallway of the Ag Hort Building
Sept. 1 - Weld Off @ MOBC

RULES FOR ALL THREE EVENTS

1. Open to Minnesota FFA members who were in 10th-12th grade during the 2023-2024 school year.
2. Safety glasses must be worn at all times.
3. Students must stay inside their assigned space the entire time of the competition.
4. Students will not be allowed to ask anyone questions during the process outside of set officials for the contest.
5. Students will not be allowed to use any type of electronic device during the competition (this includes, but is not limited to cell phones, smart watches, iPads, etc.)
6. Students must have signed an Agricultural Mechanics Safety verification form with all the required signatures. The form must be brought to the competition. See attachments.
7. Limit of one entry per chapter per competition (individuals for small engines and welding and teams of two for wood construction).

ENTRIES

The registration deadline for all three competitions is July 15 at 4:30 p.m.

Advisors can register their member(s) using the following google form:
https://forms.gle/yXcdR2i46uHg5uPB8

SPECIFIC RULES FOR EACH EVENT

Aug. 30, 2024 – Small Engines Build Off

1. The competition will begin at 5 p.m.
2. There will be two heats of five individual students. Heat two will begin as soon as possible once heat one is done.
3. Students must disassemble the engine down to the bare block and individual parts. They do not need to take apart the carburetor assembly or remove the rings.
4. An official will verify everything is disassembled before they can start the rebuilding process.
5. The following items will be provided:
    - An overhead valve engine-drained
    - A paper copy of the engine manual
    - Magnetic parts tray
    - Flywheel holder
    - Ring compressor
    - Torque wrench
    - A gasket set
    - Gas and oil will be provided in premeasured containers
    - An Engine Stand
6. Students must bring their own:
    - Specific sized wrenches-based on motor (brand and model number will be communicated to the advisors in advance of the competition)
    - Specific sized sockets and rachet
    - Flathead and Philips screw drivers
    - A clearance tool
7. Upon reassembly, students must add fluids, mount to the engine stand and start the engine on the ground.
8. The engine must run, with the ability to change from idle to full power, for 30 seconds upon completion of rebuild and then the students official time will be recorded.
9. There must be no missing or extra parts to be considered a completed project.
10. Students must complete their rebuild even after the top individuals have placed in each heat.

The students with the two fastest times from both heats will receive a placard and the small engines will be presented to the school of the winning FFA member.

Aug. 31, 2024 – Wood Construction Build Off

1. This competition is for two person teams from an individual FFA chapter.
2. Each team will be given a two-hour window to complete a raised garden bed.
3. Two separate teams will be competing at the same time in each two-hour slot.
4. The time slots available are 8-10 a.m., 10:15a.m.-12:15 p.m., 12:30-2:30 p.m., 2:45-4:45 p.m., and 5-7 p.m. Advisors can list their preferred times on the online registration form.
5. A total of ten teams of two will be allowed in the competition.
6. Plans will be made available ahead of time to those competing.
7. Another paper copy of the bench plans will be provided to the students at the event.
8. The following items will be provided:
    - Necessary lumber, plus one additional 8' board in case a mistake is made
    - A cordless skill saw
    - Necessary fasteners
    - A cordless drill
    - Bits
    - Speed square
    - A construction pencil
9. Students must bring their own:
    - Measuring tools
10. Students are not allowed to bring any other power tools or clamping devices.
11. Raised Garden Beds will be scored against each other only if they are completed within the time limit and all rules were followed.
12. Scoring will be based on the attached rubric.
13. The FFA advisor is allowed to take the raised garden bed their members built, or they will be donated to a nonprofit.

The two student teams with the highest scores will receive a placard and the members of the first-place team will receive the cordless tools used in the competition.

Sept. 1, 2024 – Weld Off

1. Individuals will be given a 90-minute window to complete a metal campfire grate.
2. Two separate individuals will be competing at the same time in each 90-minute slot.
3. The time slots available are 8-9:30 a.m., 9:40-11:10a.m., 11:20 a.m.-12:50 p.m., 1-2:30 p.m., 2:40-4:10 p.m., 4:20-5:50 p.m., and 6-7:30 p.m. Advisors can list their preferred times on the online registration form.
4. A total of 14 individuals will be allowed in the competition.
5. Plans will be made available ahead of time to those competing.
6. Another paper copy of the campfire grate plans will be provided to the students at the event.
7. The following items will be provided:
    - Metal, already precut and bent for each individual component. Students will not be allowed any additional metal pieces if a mistake is made during the build.
    - A Lincoln 210 wire feed
    - Magnets
    - Vice Grips
8. Students must bring their own:
    - Welding helmet
    - Welding gloves
    - Proper clothing for welding (e.g., long sleeves and full-length pants, no frays, no nylon fabric, and proper footwear)
    - Soap stone or another marking device
    - Measuring tools
9. Students are not allowed to bring any other power tools or clamping devices.
10. Fire grates will be scored against each other only if they are completed within the time limit and all rules were followed.
11. Scoring will be based on the attached rubric.
12. The FFA member is allowed to take the fire grate home, or they will be donated to a nonprofit.

The two members with the highest scores will receive a placard and the first-place member will receive one of the welders used in the competition.

Safety Instruction Verification for Agricultural Mechanics

FFA Member_____ School_____

For school Year _____ to _____

Tools: Circle the power tools covered by this safety verification form:

Arc Welder/MIG/TIG Drill Propane Torch

Circular Saw Miter Saw Other_____

I viewed my teacher demonstrate the safe use of the power tools listed on

_____ .
Date

Student's Signature _____

The FFA member has passed, with 100%, the power tool safety tests for the tools

listed on _____.
Date

A copy of the completed test is on file at the school district.

The FFA member demonstrated the proper safe use of the power tools listed on

_____ .
Date

Instructor's Signature _____

School verification- (if part of school policy) I verify that the above safety instruction took place and all the information is correct.

Administrator's
Signature _____ Date _____

Raised Garden Bed Rubric

Category	1-4 Does not Meet Standard	5-6 Partially Meets Standard	7-8 Meets Standard	9-10 Exceeds Standard	Score
Size of Components Match Plan Dimensions	Your project looks nothing like your plans. FEW or NO components match plan.	SOME components match plan perfectly. Many of your dimensions were off and/or you varied your project design	MOST components match plan perfectly. A few of your dimensions were significantly off.	You were accurate with very little dimension variance ALL components match plan perfectly.	
Joints	FEW or NO joints have tight, crisp, matching fit with smooth surface transition. Most all 90 deg. corners are not rounded. Lots of chipped, gapped joints, way off square and/or very unstable.	SOME joints have tight, crisp, matching fit with smooth surface transition. Some 90 deg. corners are not rounded. There are Very visible chips and gaps, off square and/or a little unstable.	MOST joints have tight, crisp, matching fit with smooth surface transition. MOST 90 deg. corners are not rounded Only minor defects in joints with small chips and/or gaps or off square joints.	ALL joints have tight, crisp, matching fit with smooth surface transition and no gaps or chips. They are structurally sound and square plus 90 deg. corners are not rounded.	
Fasteners	Nails and screw were not properly used. Nail and screw hole patterns are random and haphazard. Joints are not tight.	Nails and screw were not properly sunk. Joints could be tighter.	Nails and screws mostly sunk properly. There is symmetry in the layout of fasteners. Joints are mostly tight.	Nails and screws are properly sunk. There is symmetry in the layout of fasteners. Joints are tight.	
Overall Construction	Construction is poor. Nothing lines up. There is no symmetry. Nothing is square or level. Joints are not solid. Lots of wobbling.	Not very solid. Out of square and/or out of level in places. Parts don't line up. Symmetry is off. Things wobble.	Construction is solid, and mostly square. Most components line up and are level/things don't wobble.	Construction is very solid, symmetrical and square. Components are level and things don't wobble. Every- thing lines up and is functional.	
Technique (Skillful use of media and tools)	The student demonstrates deficient knowledge of techniques/method s in the construction of a quality project at this time. LOTS of the original parts had to be redone	The student demonstrates developing knowledge of techniques/metho ds in the construction of a quality project at this time. SOME of the original parts had to be redone	The student demonstrates proficient knowledge of techniques/metho ds in the construction of a quality project at this time. MOST parts are original (i.e. no re-work)	The student demonstrates exemplary knowledge of techniques/metho ds in the construction of a quality project at this time. ALL parts are original (i.e., no re-work)	
Craftsmanship (Neatness, precision, care)	Project construction is deficient in meeting the standards or expectations.	Project construction shows development in meeting the standards or expectations.	Project construction demonstrates proficiency in meeting the standards or expectations.	Project construction is exemplary in meeting the standards or expectations.	

Metal Grate Rubric

Category	1-4 Does not Meet Standard	5-6 Partially Meets Standard	7-8 Meets Standard	9-10 Exceeds Standard	Score
Size of Components Match Plan Dimensions	Your project looks nothing like your plans. FEW or NO components match plan.	SOME components match plan perfectly. Many of your dimensions were off and/or you varied your project design	MOST components match plan perfectly. A few of your dimensions were significantly off.	You were accurate with very little dimension variance ALL components match plan perfectly.	
Welds	Welds were not properly used and there is an extreme amount of spatter. Welds patterns are random and haphazard. Joining parts are not tight.	Welds were not properly penetrated and there is too much spatter. Symmetry of the layout is only so-so. Welded Joints could be tighter.	Welds have mostly been used correctly with little spatter. There is symmetry in the layout of metal. Joints are mostly tight.	Welds are properly penetrated with little to no spatter. There is symmetry in the layout of fasteners. Joints are tight.	
Overall Construction	Construction is poor. Nothing lines up. There is no symmetry. Nothing is square or level. Joints are not solid. Lots of wobbling.	Not very solid. Out of square and/or out of level in places. Parts don't line up. Symmetry is off. Things wobble.	Construction is solid, and mostly square. Most components line up and are level/things don't wobble.	Construction is very solid, symmetrical and square. Components are level and things don't wobble. Every- thing lines up and is functional.	
Technique (Skillful use of media and tools)	The student demonstrates deficient knowledge of techniques/methods in the construction of a quality project at this time. LOTS of the original parts had to be redone	The student demonstrates developing knowledge of techniques/methods in the construction of a quality project at this time. SOME of the original parts had to be redone	The student demonstrates proficient knowledge of techniques/methods in the construction of a quality project at this time. MOST parts are original (i.e. no re-work)	The student demonstrates exemplary knowledge of techniques/methods in the construction of a quality project at this time. ALL parts are original (i.e., no re-work)	
Craftsmanship (Neatness, precision, care)	Project construction is deficient in meeting the standards or expectations.	Project construction shows development in meeting the standards or expectations.	Project construction demonstrates proficiency in meeting the standards or expectations.	Project construction is exemplary in meeting the standards or expectations.	