

Middle School Agriculture

Mechanics CDE

(rev. Nov-2018)

Purpose

The Agricultural Mechanics CDE selects and awards those students and teams that demonstrate: (1) mastery of the subject matter and skills common to the systems areas; (2) effective communication skills; (3) superior problem solving techniques; (4) an understanding of modern technology; (5) the ability to function as individuals and as team members working together.

Eligibility

This event is open to all middle school FFA chapters and members in good standing. This event will be held during the Thursday of Delaware FFA June CDE week with the high school agriculture mechanics CDE.

Event Procedures:

Team Make-Up

Teams will consist of four members. Team ranking is determined by combining the scores of the four students from each team. Individual ranking is determined by Tool/Parts ID, exam, and Measuring Skills.

Equipment

1. Needed- Safety Materials Students Must Provide. Each event participant must adhere to the safe practices and work habits appropriate when performing required activities. Participants are responsible and must provide all personal safety equipment including:

Industrial-quality eye protection.

Clothing: Each individual shall furnish and wear appropriate clothing such as long pants, boots/sneakers, and FFA t-shirt for this event. Clothing must be in good repair and fit properly. No open toe nor open heel footwear allowed. Oversized or loose fitting clothing is dangerous around agricultural equipment and is not allowed.

Other Materials: Each participant must have a clipboard, two sharpened No. 2 pencils and a non-programmable electronic calculator. Calculators used in this event should be battery operated and silent.

2. **Tools:** Bring all tools that are needed to complete the team activity components, including cement/glue and primer. Tools will be provided for

Event Format:

The Middle School FFA Agricultural Mechanics Career Development Event is divided into systems areas. Each system includes a broad range of information and performance skills common to agricultural technology and mechanical systems.

Machinery and Equipment Systems: repair and maintenance, materials handling, processing, adjustments, metal fabrication

Electrical Systems: AC/DC power, electrical safety, electrical standards, sensing devices, electrical wiring, controls, electronics, motors and other electrical loads, operating instructions, and manufacturer's recommendations

Energy Systems: mechanical power, chemical power, wind power, solar power, hydraulic power, engine operation, maintenance, trouble-shooting, repair

Structural Systems: structures, storage, concrete, masonry, plumbing, electrical, fabrication, construction, building materials

Team:

Teams will be divided randomly amongst the given categories to complete the activity. Time allowed is 30 minutes per team activity.

Machinery and Equipment Systems- Individually complete a work order.

Structural Systems- Individually, using provided blueprint/visual, construct assigned PVC item.

*Being added in 2020: **Electrical Systems-** wire circuit (outlets, switches, GFI)

Individual

Parts/Tool ID: 25 tools/parts from the approved Tool ID list. 4 pts each, 15 minutes allowed

Measuring: 15 measuring problems appropriate to the included instructional areas using the following tools: ruler, torque wrench, caliper, speed square, and/or a level. 30 minutes allowed

Exam – from past 3 year's Delaware high school exams. 30 minutes allowed to complete the test.

SCORING:

(1) Team Activity (Total Possible Team Score=1020pts)

A. Machinery & Equipment (2 students@25pts)=50pts

B. Structural Systems (2 students@25pts)=50pts

(4) Individual (Total Possible Individual Score =230pts)

A. Tool/Parts ID (25 questions @4pts)=100pts

B. Exam (25 questions @4pts)=100pts

C. Measuring Skills (15 questions @2pts)=30pts

TIE BREAKERS

The team activity scores will be used to break a tie associated with the team rankings. If a tie still exists, the combined ID scores will be used to break the tie (then measuring, then exam if needed). The Tool/Parts ID individual scores will be used to break a tie associated with the individual rankings. If a tie still exists, the Measuring Skills will be used to break the individual tie. If a tie still exists, the exam score will be used to break the individual tie.

AWARDS

Awards will be presented to individuals and/or teams based upon their rankings at the State Fair FFA Awards Breakfast.

REFERENCES:

This list of references is not intended to be all-inclusive. Other sources may be utilized, and teachers are encouraged to make use of the very best instructional materials available. The following list contains references that may prove helpful during event preparation.

1. National FFA Core Catalog—Past CDE Material (<http://shop.ffa.org/cde-qas-c1413.aspx>)
2. Information specific to each annual event is available on the National FFA Agricultural Technology and Mechanical Systems Career Development Event web page CEV Multimedia. LTD.
3. Agricultural Engineering Technology. (ASABE) Springer Science + Business Media, LLC.
4. Mechanics in Agriculture. Prentice Hall.
5. Agricultural Mechanics Fundamentals and Applications. Delmar and Thompson
6. Modern Agricultural Mechanics, V3. Prentice Hall.
7. Developing Shop Safety Skills. American Association for Vocational Instructional Materials.
8. Power Tool Safety and Operation. Hobar Publications.
9. Practical Farm Buildings. Prentice Hall.
10. National Electrical Code (latest edition). NFPA.
11. Ag Wiring Handbook. Rural Electricity Resource Council.
12. Mechanical Technology in Agriculture. Prentice Hall.
13. Industry websites
14. Tool/Parts ID list (see appendix)
15. Plumbing Rubric (see appendix)

Plumbing Rubric				
	5	3	1	Score
Pieces	Correct pieces selected.	Selected one wrong piece.	Selected 2 or more incorrect pieces	
Primer	Less than 1/2" visible on finished work.	At least 1/2" but less than 1" visible on finished work.	One inch of primer visible on finished work.	
Placement	All pieces are positioned correctly	One piece is not positioned correctly.	More than one piece is not positioned correctly.	
Order of procedures	Applied primer, applied cement and then twisted the pipe (sequential).	Applied primer, applied cement, but did not twist pipe (sequential).	Missed two or more of the three steps (apply primer, apply cement, and twist pipe).	
Safety	Followed all safety procedures immediately.	Eventually followed safety procedures.	Did not follow safety procedures.	
			Total Score:	
			Contestant:	

Work Order Rubric				
	5	3	1	Score
Customer Information	All information correct and legible.	1-2 missing/incorrect pieces and legible.	Not legible and/or 3 or more missing/incorrect.	
Machine Specs.	All information correct and legible.	1-2 missing/incorrect pieces and legible.	Not legible and/or 3 or more missing/incorrect.	
Comments & Work Performed	All information correct and legible.	1-2 missing/incorrect pieces and legible.	Not legible and/or 3 or more missing/incorrect.	
Parts	All information correct and legible.	1-2 missing/incorrect pieces and legible.	Not legible and/or 3 or more missing/incorrect.	
Summary	All information correct and legible.	1-2 missing/incorrect pieces and legible.	Not legible and/or 3 or more missing/incorrect.	
			Total Score:	
			Contestant:	

Tool/Part ID (Identification may be the actual tools or pictures of the tools listed below).
The answer should be written as the number to the left of the item.

1	Awl (scratch)	50	Pliers, diagonal cutting
2	Bit brace	51	Pliers, linemen's side cutting
3	Bit, Auger	52	Pliers, slip-joint
4	Bit, expansion	53	Pliers, Vise Grip
5	Bit, Phillips Screwdriver	54	Putty knife
6	Bit, Spade	55	Rasp, wood
7	Bit, Standard Screwdriver	56	Rivet cutter
8	Bit, Twist Drill	57	Ruler, flexible steel
9	Bolt cutter	58	Ruler, folding wood
10	Calipers, inside	59	sander, orbital
11	Calipers, micrometer	60	Saw, adjustable hack
12	Calipers, outside	61	Saw, compass
13	Calipers, pocket slide	62	Saw, coping
14	Carpenter level	63	Saw, crosscut
15	Center punch	64	Saw, rip
16	Chisel, cold	65	Scraper
17	Chisel, wood	66	Screwdriver, offset
18	Clamp, Bar	67	Screwdriver, phillips
19	Clamp, Block	68	Screwdriver, slot head
20	Clamp, C	69	Socket extension
21	Countersink	70	Socket ratchet
22	Dividers	71	Sockets
23	Draw knife	72	Soldering copper
24	Drill, electric	73	soldering gun
25	Drill, hand	74	Square, adjustable combination
26	File, flat	75	Square, framing
27	File, half-round	76	Square, sliding tee bevel
28	File, round	77	Square, speed
29	File, Square	78	Square, T
30	File, Triangular	79	Steel tape
31	Gauge, feeler	80	Vise, metal
32	Gauger, marking	81	Wrecking bar
33	Gauger, tap and drill	82	Wrench, adjustable (crescent)
34	Glass cutter	83	Wrench, allen
35	grinder, angle	84	Wrench, box
36	Hammer, ball peen	85	Wrench, open-end
37	Hammer, curved claw	86	Wrench, pipe
38	Hammer, ripping claw	87	Wrench, ratchet box
39	Hammer, rivet	88	Wrench, tap and reamer
40	Hammer, welder's chipping	89	Wrench, torque (ft./lbs.)
41	Mallet, Rubber	90	Wrench, torque (in./lbs.)
42	Meter Stick	91	
43	Miter box	92	
44	Nail puller	93	
45	Nail Set	94	
46	Nippers, adjustable jaw	95	
47	Pipe cutter	96	
48	Plane, block	97	
49	Plane, jack	98	

Contestant:	
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Item	Answer
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
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V	
W	
X	
Y	

