

# Middle School Agriculture

## Mechanics CDE

(rev. Nov-2019)

### 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 the measurement component.

### 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**— a team of 2 will complete a work order.

**Structural Systems**— a team of 2, uses provided blueprint/visual, constructs assigned PVC item.

### 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. 45 minutes allowed, 2 points each.

### SCORING:

(1) Team Activity (Total Possible Team Score=570 pts)

A. Machinery & Equipment (1 pair)=25pts

B. Structural Systems (1 pair)=25 pts

(4) Individual (Total Possible Individual Score =130pts)

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

B. 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. 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.

**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)

<b>Plumbing Rubric</b>				
	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:	

<b>Work Order Rubric</b>				
	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	Bit brace	50	Plane, jack
2	Bit, Auger	51	Pliers, diagonal cutting
3	Bit, expansion	52	Pliers, linemen's side cutting
4	Bit, Phillips Screwdriver	53	Pliers, slip-joint
5	Bit, Spade	54	Pliers, Vise Grip
6	Bit, Standard Screwdriver	55	Putty knife
7	Bit, Twist Drill	56	Rasp, wood
8	Bolt cutter	57	Rivet cutter
9	Calipers, inside	58	Ruler, flexible steel
10	Calipers, micrometer	59	Ruler, folding wood
11	Calipers, outside	60	sander, orbital
12	Calipers, pocket slide	61	Saw, adjustable hack
13	Carpenter level	62	Saw, compass
14	Center punch	63	Saw, coping
15	Chisel, cold	64	Saw, crosscut
16	Chisel, wood	65	Saw, rip
17	Clamp, Bar	66	Scraper
18	Clamp, Block	67	Screwdriver, offset
19	Clamp, C	68	Screwdriver, phillips
20	Countersink	69	Screwdriver, slot head
21	Cutter, pipe	70	Socket extension
22	Cutter/stripper, wire	71	Socket ratchet
23	Dividers	72	Sockets
24	Draw knife	73	soldering gun
25	Drill, electric	74	Square, adjustable combination
26	Drill, hand	75	Square, framing
27	Electrode	76	Square, sliding tee bevel
28	File, flat	77	Square, speed
29	File, half-round	78	Square, T
30	File, round	79	Steel tape
31	File, Square	80	Vise, metal
32	File, Triangular	81	Wrecking bar
33	Gauge, feeler	82	Wrench, adjustable (crescent)
34	Gauge, tap and drill	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	Kit, electrical test	90	Wrench, torque (in./lbs.)
42	Kit, torch	91	
43	Mallet, Rubber	92	
44	Meter Stick	93	
45	Miter box	94	
46	Nail puller	95	
47	Nail Set	96	
48	Nippers, adjustable jaw	97	
49	Plane, block	98	

Contestant:

Item	Answer
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Contestant: \_\_\_\_\_

**SERVICE ORDER**

NO. A 3266998

**GENUINE DEALERS  
USE GENUINE PARTS**

DATE IN	DATE PROMISED
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ENGINE MODEL NO.	MANUFACTURER OF EQUIPMENT
TYPE OR SPEC NO.	TYPE OF EQUIPMENT
SERIAL/CODE NO.	EQUIP. MODEL NO.
PHONE - DAY	PHONE - EVENING
PHONE - DAY	SERIAL NO.
DATE/TIME	DATE OF PURCHASE

REPAIR AS NEEDED  TUNE-UP - MINOR  MAJOR  STARTER REPAIR  CHECK IGNITION

DIAGNOSE & CALL WITH ESTIMATE  CHANGE ENGINE OIL  CHECK COMPRESSION

WARRANTY INSPECTION  SHARPEN BLADE  CHECK CARBURETION

**CUSTOMER COMMENTS:**

\_\_\_\_\_

**WORK PERFORMED:**

\_\_\_\_\_

					SUMMARY	
PART NUMBER	DESCRIPTION	QTY.	UNIT PRICE	AMOUNT		
					PARTS	
					LABOR	
					PICKUP/DELIVERY	
					SHOP SUPPLIES/ ENVIRON. FEES	
					GAS & OIL	
					FREIGHT	
					SUBTOTAL	
					TAX	
					TOTAL	

**IMPORTANT - PLEASE NOTE**

While the manufacturer may warrant the goods sold to the customer, we make no warranties, express or implied, including any implied warranties of merchantability or fitness, with respect to such goods.

Not responsible for loss or damage in case of fire, theft or any other cause beyond our control.

I hereby authorize the above repair work to be done along with the necessary material and hereby grant you and/or your employees permission to operate the unit as necessary for the purpose of testing and/or inspection. An express mechanic's lien is hereby acknowledged on above unit to secure the amount of repairs thereto.

I FULLY UNDERSTAND THE PURPOSES OF THE SAFETY DEVICES ON THIS EQUIPMENT AND SPECIFICALLY REQUEST THAT THEY NOT BE REPAIRED OR REPLACED, AND I ASSUME RESPONSIBILITY FOR AND HOLD YOU HARMLESS FROM ANY INJURY TO ANYONE THAT MAY RESULT THEREFROM.

X \_\_\_\_\_ AUTHORIZED SIGNATURE

X \_\_\_\_\_ AUTHORIZED SIGNATURE

PLEASE REFER TO CLAIM NO. WHEN INQUIRING ABOUT SERVICE.

CLAIM NO. A-3266998 SERVICE ORDER NO. 00000000