

AGRICULTURAL MECHANICS

The Agricultural Technology and Mechanical Systems Career Development Event (CDE) helps students develop technical knowledge and an ability to work with others to solve complex agricultural problems. The event is built around students learning and executing a “systems approach” – or the process of understanding how solving one problem influences others.

Individuals complete a written exam that covers five agricultural technology and mechanical areas: compact equipment, electricity, environment and natural resources, machinery and equipment and structures.

Students and teams that perform the highest in this CDE demonstrate a mastery of systems areas subject matter, effective communication skills, superior problem-solving techniques and an understanding of modern technology.

RULES AND REGULATIONS

1. The score of the 3 high individuals on each team will be used to determine the team score.
2. Members are not required to wear Official dress.
3. The CDE will be developed from the following subject matter listed for each of the three subject matter areas:
 - a. **AGRICULTURAL POWER AND MACHINERY**
 - b. **AGRICULTURAL ELECTRIFICATION & SMALL POWER**
 - c. **AGRICULTURAL CONSTRUCTION**
4. Each contestant must participate in the following events:
 - a. Skill activities will be outlined in September (see below for past rotational system outline). Manufacture model will be released in March of the CDE Year. Each contestant will complete one or more specific hands-on performance operation(s) in a time period of 25 minutes for each operation within each of the 3 subject areas.
 - b. Written Examination will cover all subject matter areas as identified by the skill areas using the last three years of National Exams. Each contestant will have 60 minutes to complete 25 multiple choice and/or 5 problem solving questions.
5. The CDE will be conducted as follows:

Written examination	60 minutes
Agricultural Power and Machinery Skills (25 minutes each)	50 minutes
Agricultural Electrification and Power Skills (25 minutes each)	50 minutes
Agricultural Construction Skills (25 minutes each)	50 minutes

6. Contestants will be evaluated on performance in each of the following activities:

Written examination	50 points
Performance Skills at 50 points per area	<u>300 points</u>
TOTAL	350 points

The team standing will be based on 600 possible points earned by three contestants.

7. Each year Contest Coordinators will work with state staff to create an outline based around our three areas of content. This outline will be released in September of each year.

8. State Staff will work with the Career Development Advisory committee and/or Superintendent to identify the Agriculture Machine that will be the focus for the school year. Power options will be identified from the small, medium, large tractor power areas.
9. Safety:
Industry values personnel who demonstrate safe attitudes and practices, individual and cooperative teamwork, high order thinking skills and problem solving, as well as the basic technical competencies associated with work.

Each contestant must follow recommended practices and work habits appropriate for the assigned activities.

- Any Contestant who fails to follow safety practices will be removed from that area of event receiving a zero for contestants score. Contestant may rejoin in next rotation.
- Second Safety offense will equal in removal from event completely with a zero score.

Each contestant will be responsible for all personal safety equipment, example: safety glasses, welding helmet, welding gloves, welding jacket, welding chipping hammer, brush, etc.

AGRICULTURAL POWER AND MACHINERY

1. Tractor Power –
 - a. Identify external parts of the tractor.
 - b. Problem solving according to manufacturer's specifications
2. Agricultural Machinery –
 - a. Identify the parts of the current year's identified machine.
 - b. Adjust and/or calibrate machinery.

AGRICULTURAL ELECTRIFICATION and SMALL POWER

1. Electrical Circuits (every year)
 - a. Install a single pole, 3-way, switch loop and switch duplex receptacle.
 - b. Wire a sub panel with breakers, and 240 outlet. - 2022
2. Electric Motors (even year's) - 2022
 - a. Interpret motor nameplate data.
 - b. Identify motors and parts.
3. Small Engine Power (odd year's)
 - a. Identify parts of a small engine.
 - b. Troubleshoot, evaluate electrical, governor and carburetion parts.

AGRICULTURAL CONSTRUCTION AND SOIL AND WATER CONSERVATION

1. Repair and Maintenance
 - a. Recondition hand tools such as twist drills, chisels and screw drivers.
 - b. Plumbing: Identify pipe, valves and fitting type.
2. Soil and Water Conservation - 2022
 - a. Set up and level the instrument.
 - b. Record field notes for differential leveling.
3. Metal Fabrication
 - a. Arc weld basic joints (butt, lap, t-fillet, vertical up, vertical down, horizontal bead and multiple pass t-fillet) using E6011, E6010 or E7018 electrode at least 1/4" metal.
 - b. Mig welding basic joints (butt, lap, t-fillet, vertical up, vertical down, horizontal bead and multiple pass t-fillet) using mild steel or flux core electrode.
 - c. Gas Cutting: Cut mild steel including pipe. - 2022
 - d. Plasma Cutting: Cut mild steel including pipe.

TIEBREAKERS

Team

The team activity scores will be used to break a tie associated with the team rankings. If a tie still exists, the combined written exam scores will be used to break the tie.

Individual

If a tie exists between individuals, the combined highest individual/activities scores will break the tie(s). If still tied, the highest written examination score will be used to break the tie.

Tractor Word Bank

1. 3-Point Attachment Arm
2. Air Filter
3. Air Ride Seat Control
4. Altimeter
5. Battery Box Cover
6. Block Heater Plug
7. Bucket Release
8. Bucket Release
9. Chassis
10. Clutch Pedal
11. Diesel Exhaust Fluid Reservoir
12. Dip Stick
13. Door Latch
14. Engine Oil Dipstick
15. Engine Oil Filter
16. Exhaust Pipe Cover
17. Final Drive Fluid Drain Plug
18. Flasher Lights/Signals
19. Front Axle
20. Front Axle Oil Level Dipstick
21. Front Counter Weight
22. Front Hydraulic Hose
23. Front Hydraulic Manifold
24. Front Steering Rod
25. Fuel Filter
26. Fuel Sediment Bowl
27. Fuel Shut-Off
28. Grab Rail
29. Hydraulic Cylinder
30. Instrument Panel
31. Jockey Seat
32. Key Switch
33. Oil Fill
34. Oil Fill Cap
35. Oil Filter
36. PTO Control Lever
37. PTO Shield
38. Radiator
39. Rear PTO Shaft
40. Rear Spot Lights
41. Rear Wheel Weights
42. ROPS
43. SMV Sign
44. Starter
45. Tachometer
46. Tire
47. Trailer Electrical Plug
48. Transmission
49. Transmission Oil Cap Air Ride Seat Control
50. Transmission Oil Level Dipstick
51. Washer Fluid Reservoir
52. Weights

Small Engine Word Bank

1. Air Filter
2. Air Cleaner
3. Bearings
4. Blower Housing
5. Brake & Stop Switch
6. Camshaft
7. Carburetor
8. Compression Rings
9. Connecting Rod
10. Cooling Fan
11. Crankshaft Gasket
12. Crankshaft
13. Cylinder Head
14. Exhaust Valve
15. Flywheel
16. Flywheel Key
17. Fuel Tank
18. Gasket
19. Grommet
20. Intake Manifold
21. Muffler
22. Oil Rings
23. Piston
24. Pull Cord
25. Pulley Spring Assembly
26. Shroud
27. Spark Plug
28. Shroud
29. Timing Gear
30. Valve Spring
31. Valve

Oregon FFA State Ag Mechanics CDE

**Drill Bit Sharpening
(50pts)**

Member Name: _____

Contestant #: _____

Chapter: _____

- Cutting Edge (10pts) _____
- Heel (10pts) _____
- Dead Center (10pts) _____
- Cuts (10pts) _____
- Safety (10pts) _____

Total Points: _____/50

**Oregon FFA State Ag Mechanics CDE
Welding Rubric
(50pts)**

Contestant Name: _____ **Contestant #:** _____ **Chapter** _____

5 Components of Visual Inspection:

Flat Face: Examine the face of the weld.

Circle one

Yes No

- Is the _weld face flat or slightly convex?
A concave weld can cause centerline cracking and a convex weld can cause the weld to weaken at the toes.

Proper Placement: Look at the placement of the weld.

Yes No

Yes No

- Is the weld centered between the two pieces to be joined?
- Are the weld beads stacked from bottom to top?
A weld that is too high or too low in the weld joint will be weaker.

Fairly Uniform: Determine if the weld is uniform and the proper size.

Yes No

Yes No

- Is the weld uniform from beginning to end?
- Are the weld legs equal in size?
A weld with legs that are too small can cause the weld to be undersized and possibly too weak.
A weld with legs that are too big will be oversized and may cause too much heat and distortion.

Good Wash-In: Examine how well the weld is washed in.

Yes No

- Is the weld washed in smoothly at each of the toes?
A weld with too little wash-in often appears raised up with jagged edges along the toes.
A weld with too much wash-in has undercut that can cause a crack to form.

Follow Weld Procedures: Reference WPS.

Yes No

Was the power source set up correctly?

Yes No

Is the completed weld test cleaned, free of slag and spatter?

Each yes answer equals 10 points, for a total of 80 points. Weld score

Safety (20pts) _____

Total Score (100 pts) _____

Grand Total (Total Score divided by 2) _____/50

