**Ag Mech CDE**

**Potential Skill Areas for 2024**

See the Indiana Ag content standards and competencies for 5088 (Agriculture Power, Structures and Technology) 7112 (Agriculture Structures Fabrication and Design) and 7228 (Agriculture Mechanization and Technology Capstone) for potential skills.

The following Areas will be emphasized and modified to fit one of the five areas and or the team activity. See IN FFA Web site, <https://www.inffa.org/page.aspx?ID=2890> for reference materials from the Ag Lesson Plan Library. Score sheets and correct procedures will be based on these. All necessary tools and supplies will be provided except for welding. See below.

Additional websites are available in the “Handbook and Guidelines.”

1. SMAW (Shielded Metal Arc Welding) and MIG (Metal Inert Welding) Working on making this possible at Benton Central this year. Will post if it is dropped. Must be able to read and follow specifications for the task and perform the skill. Maybe required to select materials and electrodes. Will be using mild steel of various shapes and a variety of electrodes. Must be trained in safety and welding procedures to complete the tasks. See below for proper gear.

2. Must be able to read the schematic drawings of wiring diagrams and perform the wiring skills. Should know proper wiring techniques for single-pole, three-way and four-way switches and duplexes and light fixtures in a circuit. Will utilize residential code procedures instead of commercial code. See reference sheet provided on the website, Lesson A4-6 Preparing & Using Schematics.

3. Be familiar with parallel and series circuits, using multi-testers to measure volts, amps, ohms and calculate watts. Be familiar with how to utilize batteries as a power source in both parallel and series. Should know how to properly solder wires. If given a schematic of a wiring harness contestant should be able to trace power flow, test for resistance, short to ground or power, and open circuits; this may include analog and CAN Bus circuits.

4. Repair and maintenance of small gas engines. Engine utilized will be a Briggs and Stratton 5 horsepower Intek, single-cylinder, OHV, horizontal shaft engine or a similar model. Must be able to perform the skill using repair manual. We will be utilizing the Briggs and Stratton manuals, “Single Cylinder OHV Air-Cooled Engines” and “Single Cylinder “L” Head (built after 1981) Repair Manual. Will need to be able to use micrometers and specialty tools to take specific readings like bore, stroke, and crankpin diameters. Other potential specialty tools may include torque wrench, piston ring compressor, piston ring expander, feeler gauges, flywheel strap wrench and valve spring compressor.

5. Be familiar with concrete and masonry skills. How to plan and lay out job. Prepare for the concrete pour. Ability to mix gravel, sand, water and cement to make concrete and calculate the amounts of each. Placing, finishing, and curing concrete. How to mix mortar and lay blocks. How to tool joints, patch holes, and clean smears.

6. Be familiar with plumbing (copper, galvanized and PVC) skills.

How to select fittings and pipe. How to measure, mark, cut, ream, thread, and join pipe.

How to join copper tubing with solder, flare fittings, and compression fittings.

7. Be familiar with using power and hand woodworking tools. Will be given a plan or schematic with specific instructions or you may have to make your own drawings, cutting list and bill of materials. See reference sheet provided on the state website**,** Lesson A-3-1 Planning & Designing Projects. All necessary reference materials will be provided to make any calculations. Or may be asked to use tools to measure and cut specific pieces of lumber.

8. May be given plans or schematics with specific instructions on making a specific project using any of the skills listed above. Be familiar with how to demonstrate proper methods for constructing buildings or building components. Demonstrate knowledge of building materials used in construction building. See Lesson A3–9 Framing Agricultural Structures and Lesson A3–1 Planning and Designing Projects on state website for examples.

9. Given a service manual for a piece of equipment, will be able to complete adjustments or calibration or a minor repair to that piece of equipment. Main skill is being able to locate the task in the service manual then complete the skill. Should be able to locate parts and prices from a website and or manual.

**Reminder: You need to bring all your own gear and proper clothing. Tools will be provided.**

1. Each participant must have all the necessary equipment for SMAV or MIG welding and brazing, such as helmets, shields, gloves, welding jacket and welding leathers (optional).

2. Clothing: Each individual shall furnish and wear appropriate clothing such as long pants and a long-sleeved cotton shirt or coveralls or lab coat are recommended for this event. Clothing must be in good repair and fit properly. Oversized or loose fitting clothing is dangerous around agricultural equipment and is not allowed. Long-sleeves must be worn when welding or oxy-fuel cutting. No open-toed footwear shall be worn during the event.

3. Eye protection: each participant will need to provide their own safety glasses or goggles to be worn at all times except during the test. See handbook for type of safety glasses needed.

4. Each participant needs a clipboard, pencil, and calculator (may not use a phone at any time).