

Agricultural Mechanics

Jefferson West Agriculture Education

Verification Signatures	Hours Completed _____
Student: _____	Date: _____
Instructor: _____	Date: _____

Key to Integrated Competencies
 (A)- Academic -- (AC) - Communications/English, (AM)-Math, (AS)-Science
 (CD) – Career Development (E) SAE-Based Learning (L)- Leadership

Circle to indicate level of competency achieved:
 3 Skilled-Works Independently 2 Limited skill-Needs assistance 1 Skill undeveloped-but received instruction 0 No exposure

- I. The Ag Mechanics Industry and Careers**
- 3 2 1 0 1. Describe 10 careers in the field of ag mechanics
 - 3 2 1 0 2. Explain the importance of welding and construction in the local economy
 - 3 2 1 0 3. Identify 10 local business that require ag mechanics skills
 - 3 2 1 0 4. List the causes of accidents in the workplace
 - 3 2 1 0 5. Write a 1 and 1/2 page paper over two agriculture careers of interest
 - 3 2 1 0 6. Select an agriculture career and research and write a 1/2 page report over the education needed.
- II. Supervised Agriculture Experience (SAE) & Record Keeping**
- 3 2 1 0 1. Identify and maintain the SAE (CD)
 - 3 2 1 0 2. Construct a personal budget (AM)
 - 3 2 1 0 3. Utilize the Kansas FFA SAE Record book to monitor the SAE (CD)
 - 3 2 1 0 4. Complete a local and district proficiency award application (L)
 - 3 2 1 0 5. Complete chapter and/or State FFA Degree Applications (L)
 - 3 2 1 0 6. Use Quicken to track income and expense in cash, checking, and savings (CD)
 - 3 2 1 0 7. Track SAE skills developed, hours worked as well as FFA, School, and community activities using the Ag Ed record book. (CD)
 - 3 2 1 0 8. Set appropriate long and short term goals for the SAE program.
- A. Lab Activities**
- 3 2 1 0 1. Prepare income and expense records (AM, CD)
 - 3 2 1 0 2. Prepare monthly cash flow statements (AM, CD)
 - 3 2 1 0 3. Record personal and business inventories, assets, and liabilities (AM, CD)

- III. The National FFA Organization and Leadership**
- 3 2 1 0 1. Participate in Student Development Activities as established by the POA (L)
 - 3 2 1 0 2. Participate in Chapter Development Activities as established by the POA (L)
 - 3 2 1 0 3. Participate in Community Development Activities as established by the POA. (L)
 - 3 2 1 0 4. Participate in the Welding and/or Ag Mechanics FFA Career Development Events. (E, L)
- IV. Arc Welding**
- 3 2 1 0 1. Explain the physical processes of arc welding (AS)
 - 3 2 1 0 2. List the proper arc-welding safety guidelines (AS)
 - 3 2 1 0 3. Identify arc-welding safety hazards (AS)
 - 3 2 1 0 4. Identify pieces of arc-welding equipment (AS)
 - 3 2 1 0 5. Differentiate between AC and DC welding processes (AS)
- A. Lab Activities (E)**
- 3 2 1 0 1. Demonstrate an arc-weld bead pad
 - 3 2 1 0 2. Demonstrate an arc-weld flat butt weld Demonstrate an arc-weld lap weld in the flat position
 - 3 2 1 0 3. Demonstrate an arc-weld T-weld in the flat position
- V. MIG Welding**
- 3 2 1 0 1. List the proper MIG welding safety guidelines (AS)
 - 3 2 1 0 2. Identify MIG welding safety hazards (AS)
 - 3 2 1 0 3. Identify pieces of MIG welding equipment (AS)
 - 3 2 1 0 4. Explain the physical processes of MIG welding (AS)

- A. Lab Activities (E)**
- 3 2 1 0 1. Demonstrate a MIG bead pad
 - 3 2 1 0 2. Demonstrate a MIG butt weld in the flat position
 - 3 2 1 0 3. Demonstrate a MIG lap weld in the flat position
 - 3 2 1 0 4. Demonstrate a MIG T-weld in the flat position
 - 3 2 1 0 5. Demonstrate a MIG horizontal butt
 - 3 2 1 0 6. Demonstrate a MIG horizontal lap weld
 - 3 2 1 0 7. Demonstrate a MIG horizontal T-weld Demonstrate a MIG vertical T-weld
- VI. Oxy-Acetylene Welding and Cutting**
- 3 2 1 0 1. List the oxy-acetylene welding and brazing safety guidelines (AS)
 - 3 2 1 0 2. List the oxy-acetylene cutting safety guidelines (AS)
 - 3 2 1 0 3. Identify oxy-acetylene cutting, welding, and brazing equipment (AS)
 - 3 2 1 0 4. Identify oxy-acetylene cutting, welding, and brazing safety hazards (AS)
 - 3 2 1 0 5. Explain the physical processes of oxy-acetylene welding, cutting, and brazing (AS)
- A. Lab Activities (E)**
- 3 2 1 0 1. Demonstrate an oxy-acetylene bead pad
 - 3 2 1 0 2. Demonstrate an oxy-acetylene butt weld in the flat position
 - 3 2 1 0 3. Demonstrate an oxy-acetylene lap weld in the flat position
 - 3 2 1 0 4. Demonstrate a braze bead pad
 - 3 2 1 0 5. Demonstrate a braze butt weld in the flat position Demonstrate a braze lap weld in the flat position
 - 3 2 1 0 6. Demonstrate oxy-acetylene cutting techniques

VII. Machine Tool Use

- 3 2 1 0 1. Explain the use & function of the bench grinder (AS)
- 3 2 1 0 2. Explain the use and function of the hand grinder (AS)
- 3 2 1 0 3. Explain the use and function of the chop saw (AS)
- 3 2 1 0 4. Explain the use and function of the drill press (AS)
- 3 2 1 0 5. Explain the use and function of the plasma cutter (AS)
- 3 2 1 0 6. List the proper bench grinder safety guidelines
- 3 2 1 0 7. List the proper hand grinder safety guidelines
- 3 2 1 0 8. List the proper chop saw safety guidelines
- 3 2 1 0 9. List the proper drill press safety guidelines
- 3 2 1 0 10. List the proper plasma cutter safety guidelines

A. Lab Activities (E)

- 3 2 1 0 1. Demonstrate proper use of the bench grinder
- 3 2 1 0 2. Demonstrate proper use of the angle grinder
- 3 2 1 0 3. Demonstrate proper use of the chop saw
- 3 2 1 0 4. Demonstrate proper use of the drill press
- 3 2 1 0 5. Demonstrate proper use of the plasma cutter
- 3 2 1 0 6. Demonstrate proper use of various hand tools

VIII. Lay Out and Setup of Projects

- 3 2 1 0 1. Read blueprints and follow detail plans for project construction
- 3 2 1 0 2. Make and read a working drawing (AS)
- 3 2 1 0 3. Estimate materials needed for a project
- 3 2 1 0 4. Calculate project costs
- 3 2 1 0 5. Prepare a bill of materials
- 3 2 1 0 6. Identify types of metal (AS)
- 3 2 1 0 7. Construct group projects
- 3 2 1 0 8. Construct individual projects
- 3 2 1 0 9. Make a project drawing on computer (AC)

IX. Soil and Land Evaluation

- 3 2 1 0 1. Explain the 8 various land capability classes.
- 3 2 1 0 2. Evaluate physical land characteristics and explain their effect on the land class. (Soil texture, Slope, Depth, Erosion, Permeability, & Run-off) (AS)
- 3 2 1 0 3. Make recommendations on land use and practices based on soil factors
- 3 2 1 0 4. Interpret soil test data (AS)
- 3 2 1 0 5. Evaluate land factors based on home site considerations. (Septic System, Sewage Lagoon, Lawns and Landscape, & Foundations for Buildings).

A. Lab Activities (E)

- 3 2 1 0 1. Judge a land site pit
- 3 2 1 0 2. Judge a home site pit
- 3 2 1 0 3. Participate in the Land and Home site CDE

X. Electricity in Agriculture

- 3 2 1 0 1. Identify common used tools and equipment in electricity
- 3 2 1 0 2. Properly demonstrate use of electricity tools
- 3 2 1 0 3. Distinguish between AC and DC currents
- 3 2 1 0 4. Identify common terms used in electricity
- 3 2 1 0 5. Learn basic fundamentals in AC wiring to code
- 3 2 1 0 6. Calculate the number of watts used by a electrical tool (AM)
- 3 2 1 0 7. Calculate the number of watt-hours used by an given device (AM)
- 3 2 1 0 8. Calculate an electrical bill for a given set of electrical devices (AM)
- 3 2 1 0 9. Draw various wiring diagrams for different circuits

A. Lab Activities (E)

- 3 2 1 0 1. Demonstrate correct wiring of a 110 volt plug
- 3 2 1 0 2. Demonstrate correct wiring of a 110 volt light
- 3 2 1 0 3. Demonstrate correct wiring of a 110 volt switch
- 3 2 1 0 4. Demonstrate correct wiring of a 110 volt loop circuit
- 3 2 1 0 5. Use an multi-meter to test DC Volts, DC Amps, and AC Volts
- 3 2 1 0 6. Use an multi-meter to test continuity of a circuit

XI. Safety/Ag Mechanics Lab Orientation

- 3 2 1 0 1. Identify and demonstrate proper methods of shop/lab clean-up
- 3 2 1 0 2. Identify various tool storage locations
- 3 2 1 0 3. Learn the components of the fire triangle
- 3 2 1 0 4. Explain proper use of a fire extinguisher
- 3 2 1 0 5. Explain proper shop safety color coding
- 3 2 1 0 6. Explain the importance of eye safety
- 3 2 1 0 7. Explain the importance of correct clothing

A. Lab Activity (E)

- 3 2 1 0 1. Complete a shop/lab safety test with 100% accuracy.

XII. Mathematics Career Development Skills (CD)

- 3 2 1 0 1. Estimate, apply, and solve problems involving fractions, decimals, and percentages (AM)
- 3 2 1 0 2. Translate written and verbal statements into mathematic expressions (AM)

- 3 2 1 0 3. Convert common units of measurement within and/or across measurement systems (AM)
- 3 2 1 0 4. Apply concepts of measurement such as distance, direction, rate, and time (AM)
- 3 2 1 0 5. Construct or interpret tables, charts, maps, and/or graphs (AM)
- 3 2 1 0 6. Decide whether a problem is best solved with a computer, calculator, paper and pencil, or mental arithmetic techniques (AM)

XIII. Communications Career Development Skills (CD)

- 3 2 1 0 1. Follow oral instructions (AC)
- 3 2 1 0 2. Participate in group communication activities (AC)
- 3 2 1 0 3. Give oral directions (AC)
- 3 2 1 0 4. Use language and format appropriate to the subject matter, purpose, and audience (AC)
- 3 2 1 0 5. Prepare a Powerpoint Presentation over a agriculture related topic researched in class.

XIV. Other Career Development Skills (CD)

- 3 2 1 0 1. Identify and explain the use of common supplies for a given occupational area. (CD)
- 3 2 1 0 2. Set priorities in which several tasks will be accomplished (CD)
- 3 2 1 0 3. Utilize time management to reduce conflicts
- 3 2 1 0 4. Apply rules including punctuality, attendance, and work ethic (CD)

XV. Computer Literacy (CD)

- 3 2 1 0 1. Define, understand, and use common computer technology terms (CD)
- 3 2 1 0 2. Compose, organize, and edit information using a computer (CD)
- 3 2 1 0 3. Use presentation software to design and create a presentation (CD)
- 3 2 1 0 4. Use ag related software/websites (CD)
- 3 2 1 0 5. Access, navigate, & use on-line services (CD)
- 3 2 1 0 6. Send and receive email messages with enclosures (CD)
- 3 2 1 0 7. Use Quicken to manage personal finances (CD)
- 3 2 1 0 8. Use Microsoft Office (Word, Excel, Powerpoint, and Internet Explorer) to complete projects (CD)