Kansas Agriculture Education

Agriculture Mechanics

Name _____ SSN ____-___-_____

Instructor _____School Year _____

RATING SCALE: 3: Skilled, works independently
2: Competent, may need assistance
1: Received instruction, skill undeveloped
0: No exposure, instruction or training

INTEGRATION: (M) Math (S) Science
(E) Language Arts (L) Lab Activity
(C) Career Development Skill
(EB) Experienced Based
(LK) Life Knowledge

Enrollment Date ____/____/____ Completion Date ____/____/____ Hours completed _____

I certify that the student received the training in the area indicated.

Student Signature _____ Date _____

Instructor Signature _____ Date _____

Competencies _____/202

I. The Ag Mechanics Industry and Careers

3 2 1 0 1. Describe 10 careers in the field of ag mechanics (E)
3 2 1 0 2. Explain the importance of welding and construction in the local economy (E)
3 2 1 0 3. Identify local businesses 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 ½ page paper over two agriculture careers of interest (E)
3 2 1 0 6. Select an agriculture career, research, and write a ½ page report over the education needed

II. Supervised Agriculture Experience (SAE) & Record Keeping

3 2 1 0 1. Identify and maintain the SAE (C)
3 2 1 0 2. Construct a personal budget (M)
3 2 1 0 3. Utilize the Kansas FFA SAE Record book to monitor the SAE (C)
3 2 1 0 4. Complete a local and district proficiency award applications (E)
3 2 1 0 5. Complete chapter and/or State FFA Degree applications (E)
3 2 1 0 6. Use Quicken to track income and expense in cash, checking, and savings (C)
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 (C)
3 2 1 0 8. Set appropriate SAE long and short term goals (E)

A. Lab Activities (L)(EB)

3 2 1 0 1. Prepare income and expense records (C, M)
3 2 1 0 2. Prepare monthly cash flow statements (C, M)
3 2 1 0 3. Record personal and business inventories, assets, and liabilities (C, M)

III. The National FFA Organization and Leadership

3 2 1 0 1. Participate in Student Development activities established by the local POA
3 2 1 0 2. Participate in Chapter Development activities established by the local POA
3 2 1 0 3. Participate in Community Development activities established by the local POA
3 2 1 0 4. Participate in the Welding and/or Ag Mechanics FFA Career Development Events (E)

IV. Arc Welding

3 2 1 0 1. Explain the physical processes of arc welding (S)
3 2 1 0 2. List the proper arc welding safety guidelines (S)
3 2 1 0 3. Identify arc welding safety hazards (S)
3 2 1 0 4. Identify pieces of arc welding equipment
3 2 1 0 5. Differentiate between AC and DC welding (S)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate a 6013 and 6011 flat butt weld
3 2 1 0 2. Demonstrate a 7018 flat pipe-on-pipe weld
3 2 1 0 3. Demonstrate a 6013 and 6011 vertical down butt weld

V. MIG Welding

3 2 1 0 1. List the proper MIG welding safety guidelines (S)
3 2 1 0 2. Identify MIG welding safety hazards (S)
3 2 1 0 3. Identify pieces of MIG welding equipment
3 2 1 0 4. Explain the physical processes of MIG welding (S)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate a flat butt weld
3 2 1 0 2. Demonstrate a T-weld in the flat position
3 2 1 0 3. Demonstrate a horizontal butt weld
3 2 1 0 4. Demonstrate a vertical down butt weld
3 2 1 0 5. Demonstrate a pipe-on-pipe flat butt weld

VI. Oxy-Acetylene Cutting

3 2 1 0 1. List the oxy-acetylene welding and brazing safety guidelines (E)
3 2 1 0 2. List the oxy-acetylene cutting safety guidelines (E)
3 2 1 0 3. Identify oxy-acetylene cutting, welding, and brazing equipment
3 2 1 0 4. Explain the physical processes of oxy-acetylene welding, cutting, and brazing (E)

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate oxy-acetylene cutting techniques:
straight – freehand
round/circle – freehand
pierce a hole

VII. Plasma Cutting

3 2 1 0 1. List the plasma cutting safety guidelines (E)
3 2 1 0 2. Identify plasma cutting equipment
3 2 1 0 3. Explain the processes of plasma cutting and proper the techniques involved.

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate plasma cutting techniques:
straight – freehand
round/circle – freehand
pierce a hole
3 2 1 0 2. Demonstrate proper setups and adjustments for different metal thicknesses

VIII. General Shop/Machine Tool Use

3 2 1 0 1. Explain the use and function of the bench grinder (E)
3 2 1 0 2. Explain the use and function of the hand grinder (E)
3 2 1 0 3. Explain the use and function of the chop saw (E)
3 2 1 0 4. Explain the use and function of the hot saw (E)
3 2 1 0 5. Explain the use and function of the floor sheer (E)
3 2 1 0 6. Explain the use and function of the drill press (E)
3 2 1 0 7. Explain the use and function of power hand drills (E)
3 2 1 0 8. Explain the use and function of pneumatic tools (E)
3 2 1 0 9. List the proper bench grinder safety guidelines

3 2 1 0 10. List the proper hand grinder safety guidelines
3 2 1 0 11. List the proper chop saw safety guidelines
3 2 1 0 12. List the proper hot saw safety guidelines
3 2 1 0 13. List the proper floor sheer safety guidelines
3 2 1 0 14. List the proper drill press safety guidelines
3 2 1 0 15. List the proper power hand tools safety guidelines
3 2 1 0 16. List the proper pneumatic tools safety guidelines
3 2 1 0 17. List the proper woodworking hand tool safety guidelines
3 2 1 0 18. List the proper woodworking power tool safety guidelines

A. Lab Activities (L)

3 2 1 0 1. Demonstrate the proper bench grinder safety guidelines
3 2 1 0 2. Demonstrate the proper hand grinder safety guidelines
3 2 1 0 3. Demonstrate the proper chop saw safety guidelines
3 2 1 0 4. Demonstrate the proper hot saw safety guidelines
3 2 1 0 5. Demonstrate the proper floor sheer safety guidelines
3 2 1 0 6. Demonstrate the proper drill press safety guidelines
3 2 1 0 7. Demonstrate the proper power hand tools safety guidelines
3 2 1 0 8. Demonstrate the proper pneumatic tools safety guidelines
3 2 1 0 9. Demonstrate the proper woodworking tools safety guidelines

IX. Layout 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 (E)
3 2 1 0 3. Estimate materials needed for a project
3 2 1 0 4. Calculate project costs (M)
3 2 1 0 5. Prepare a bill of materials
3 2 1 0 6. Identify types of metal (E)
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 the computer (E)

X. Soil / Land Evaluation

3 2 1 0 1. Explain the eight various land capability classes
3 2 1 0 2. Evaluate the physical land characteristics and explain their effect on the land classification
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

A. Lab Activities (L)

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

XI. Electricity in Agriculture

3 2 1 0 1. Identify common used tools and equipment in electricity
3 2 1 0 2. Properly demonstrate the use of electrical 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. Understand the basic fundamentals in AC wiring to NEC code
3 2 1 0 6. Calculate the number of watts used by a device or a circuit (M)
3 2 1 0 7. Calculate the number of watts-hours used by a device or a circuit (M)
3 2 1 0 8. Calculate an electrical bill for a given set of devices (M)
3 2 1 0 9. Draw various wiring diagrams for different circuits

A. Lab Activities (L)(EB

3 2 1 0 1. Demonstrate correct wiring of a 110 volt receptacle
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 different 110 volt circuits
3 2 1 0 5. Demonstrate the proper use of a multi-meter to measure volts, amperage, and ohms in AC and DC circuits
3 2 1 0 6. Demonstrate the proper use of a multi-meter to test for continuity of a circuit

XII. Plumbing in Agriculture

3 2 1 0 1. Identify common used tools and equipment in plumbing
3 2 1 0 2. Properly demonstrate the use of simple plumbing tools
3 2 1 0 3. Identify common terms used in plumbing
3 2 1 0 4. Understand the basic fundamentals in plumbing
3 2 1 0 6. Calculate the amount of pressure in differing lines and systems (M)
3 2 1 0 7. Calculate the amount of flow in differing lines and systems (M)
3 2 1 0 8. Calculate the total amount of resistance in a line or system (M)
3 2 1 0 9. Draw various plumbing diagrams for different systems

A. Lab Activities (L)(EB)

3 2 1 0 1. Demonstrate proper steps in attaching glue/no-glue joints
3 2 1 0 2. Demonstrate proper layout procedures before fitting begins

XIII. Small Engine Maintenance/Repair

3 2 1 0 1. Integrate safety practices specific to Small Engine Repair and Maintenance
3 2 1 0 2. Operate and perform necessary equipment for assembling and disassembling.
3 2 1 0 3. Review and examine maintenance schedules and procedures.
3 2 1 0 4. Identify and reference components, parts, models, and serial numbers.
3 2 1 0 5. Check fuel, lubricant and fluid levels.
3 2 1 0 6. Identify stress points and wear indicators.
3 2 1 0 7. Observe and operate computer and electronic diagnostic equipment.
3 2 1 0 8. Select, use and calibrate measuring and testing devices like calipers and gauges
3 2 1 0 9. Calculate measurements with both standard and metric instruments. (M)
3 2 1 0 10. Properly use, read, and calibrate micrometers.
3 2 1 0 11. Assess equipment and systems using diagnostics
3 2 1 0 12. Demonstrate trouble-shooting procedures.
3 2 1 0 13. Diagnose wear and condition of parts.
3 2 1 0 14. Evaluate tolerances and perform needed repairs

XIV. Production Ag Machinery, Tools, and Operation

3 2 1 0 1. Understand the use and functional operation of tools and machinery found in portions on production agriculture
3 2 1 0 2. Explain the advantages and disadvantages of becoming an entrepreneur (E)

A. Lab Activities (L)

3 2 1 0 1. Observe the use of different powered machines , tools, and implements used in production agriculture
3 2 1 0 2. Make a plan to market a personal business
3 2 1 0 3. Create financial statements for Agri-Entrepreneurship business (M)

XV. 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 the proper use of a fire extinguisher
3 2 1 0 5. Explain proper shop safety color coding

A. Lab Activities (L)(EB)

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

XVI. Project Construction(EB)

3 2 1 0 1. _____

XVII. Mathematics Career Development Skills (C)

3 2 1 0 1. Estimate, apply, and solve problems involving fractions, decimals, and percentages (M)
3 2 1 0 2. Translate written and verbal statements into math expressions (M)
3 2 1 0 3. Convert common units of measurement within and/or across measurement systems (M)
3 2 1 0 4. Apply concepts of measurement such as distance, direction, rate, and time (M)
3 2 1 0 5. Construct or interpret tables, charts, maps, and/or graphs (M)
3 2 1 0 6. Decide whether a problem is best solved with a computer, calculator, paper, and pencil, or mental arithmetic techniques (M)

XVIII. Career Development Skills (C)

3 2 1 0 1. Follow oral instructions (E)
3 2 1 0 2. Participate in group communication activities (E)
3 2 1 0 3. Give oral directions (E)
3 2 1 0 4. Use language and format appropriate to the subject matter, purpose, and audience (E)
3 2 1 0 5. Set priorities that several tasks will be accomplished (C)
3 2 1 0 6. Utilize time management to reduce conflicts (C)
3 2 1 0 7. Apply rules including punctuality, attendance, and work ethic (C)
3 2 1 0 8. Access and use information to develop educational and career options (C)
3 2 1 0 9. Demonstrate stress management skills (C)

XX. Computer Literacy (C)

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

XXI. LifeKnowledge Lessons

3 2 1 0 1. Professional ethics and personal character (HS 35)
3 2 1 0 2. Conduct a job search (HS 36)
3 2 1 0 3. Developing a resume (HS 37)
3 2 1 0 4. Interviewing techniques (HS 38)