

Plant and Soil Science

Jefferson West Agriculture Education

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

Name: _____ SSN: ____/____/____
 Instructor: Steve Buss School Year: _____

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 Agronomy and Production Agriculture Industry and Careers

- 3 2 1 0 1. List 10 career opportunities available in the agriculture industry
- 3 2 1 0 2. Explain the impact of agriculture and crop production on the local economy
- 3 2 1 0 3. Identify local career opportunities in agriculture
- 3 2 1 0 4. List the level of education required for 5 careers in agriculture
- 3 2 1 0 5. Explain the impact of agriculture on the Kansas economy

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 (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 (E)

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

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 established by the POA (L)
- 3 2 1 0 4. Research a 3-8 minute speech on an agricultural topic (E)
- 3 2 1 0 5. Write a final manuscript for a 3-8 minute speech over an agriculture topic using MLA style with title page and works cited (AC, CD)
- 3 2 1 0 6. Present a memorized 3-8 minute agriculture speech to the class (AC, L, CD)
- 3 2 1 0 7. Participate in the Agronomy CDE (E)

IV. 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

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

V. Plant Structures

- 3 2 1 0 1. Distinguish between types of plant cell (AS)
- 3 2 1 0 2. Identify and describe the function of cellular bodies (AS)

- 3 2 1 0 3. Identify the parts of monocot and dicot seeds and list their functions
 - 3 2 1 0 4. Distinguish between fibrous and tap-root systems (AS)
 - 3 2 1 0 5. Distinguish between the types of each seed (AS)
- #### A. Lab Activities
- 3 2 1 0 1. Dissect and identify the parts of a plant stem (AS)
 - 3 2 1 0 2. Label the parts of a plant leaf (AS)
 - 3 2 1 0 3. Identify the parts of complete and incomplete flowers and distinguish between them (AS)
 - 3 2 1 0 4. Identify the parts of a plant (AS)
 - 3 2 1 0 5. Differentiate between leaf shapes (AS)
 - 3 2 1 0 6. Differentiate between root types (AS)
 - 3 2 1 0 7. Differentiate between flower parts (AS)

VI. Plant Systems and Growth

- 3 2 1 0 1. Describe methods of plant classification (AS)
 - 3 2 1 0 2. Distinguish between the germination of monocots and dicots (AS)
 - 3 2 1 0 3. Define photoperiod (AS)
 - 3 2 1 0 4. Explain the processes of photosynthesis, respiration, and transpiration (AS)
- #### A. Lab Activities (E)
- 3 2 1 0 1. Differentiate between plant leaf shapes, root types, and flower parts (AS)

VII. Legal Land Description/Soil Survey

- 3 2 1 0 1. Define terms associated with land measurement
 - 3 2 1 0 2. Write legal land descriptions from 1/4 section down to 10 acres in size (AC)
 - 3 2 1 0 3. Utilize resource information found in soil survey guides to make decisions on land use
 - 3 2 1 0 4. Research various map units in the soil survey guide
- #### A. Lab Activities (E)
- 3 2 1 0 1. Analyze and interpret county soil surveys

VIII. Weed, Disease, And Pest Control

- 3 2 1 0 1. Describe Integrated Pest Management
- 3 2 1 0 2. Identify weed, disease, and pest damage (AS)
- 3 2 1 0 3. Show diseased material handling techniques (AS)
- 3 2 1 0 4. Demonstrate how to mix pesticides (AS)
- 3 2 1 0 5. Identify safe procedures when handling pesticides
- 3 2 1 0 6. Calculate pesticide application rates (AM)
- 3 2 1 0 7. Identify the components of a pesticide label

A. Lab Activities

- 3 2 1 0 1. Locate PPE, REL, and Mixing instructions on a pesticide label

IX. The Science of Agriculture

- 3 2 1 0 1. Distinguish between basic and applied science (AS)
- 3 2 1 0 2. Explain the scientific method (AS)
- 3 2 1 0 3. Discuss the advances made by American Agriculture
- 3 2 1 0 4. Cite discoveries that have made food safer and less expensive for the consumer
- 3 2 1 0 5. Describe factors that have made US Agriculture more efficient

A. Lab Activities

- 3 2 1 0 1. Conduct a small Agriscience research project related to crop production

X. Soil Origin and Fertility

- 3 2 1 0 1. Identify various types of parent material types and soil forming factors
- 3 2 1 0 2. Describe and determine the texture of a soil sample (AS)
- 3 2 1 0 3. Diagram the movement of water through soil (AS)
- 3 2 1 0 4. Explain the importance of clay and organic matter in soils (AS)
- 3 2 1 0 5. Outline the impact of soils on crop yields (AS)
- 3 2 1 0 6. Describe methods of building soil fertility (AS)
- 3 2 1 0 7. List and differentiate between micro and macro soil nutrients (AS)
- 3 2 1 0 8. Describe how pH affects plant growth (AS)

A. Lab Activities

- 3 2 1 0 1. Perform and interpret soil tests (AS)
- 3 2 1 0 2. Identify the texture of a soil sample (AS)
- 3 2 1 0 3. Analyze soil test results (AS)
- 3 2 1 0 4. Formulate the proper mix of dry fertilizers (AM)

XI. Genetics

- 3 2 1 0 1. Define the terms: hybrid, heterosis, homozygous, heterozygous, genotype, and phenotype (AS)

- 3 2 1 0 2. Use and analyze a Punnet square (AS)
- 3 2 1 0 3. Specify how the principles of genetics are used in plant and animal breeding programs (AS)
- 3 2 1 0 4. Explain how hybrid plant varieties are developed (AS)
- 3 2 1 0 5. Differentiate between dominant and recessive genes (AS)
- 3 2 1 0 6. List examples of genetically engineered products (AS)
- 3 2 1 0 7. Summarize laws and environmental/social concerns associated with genetic engineering (AS)

A. Lab Activities

- 3 2 1 0 1. Monitor phenotypes in a plant breeding program (AS)
- 3 2 1 0 2. Research genetic engineering (AS)

XII. Crop Evaluation

- 3 2 1 0 1. Properly classify crops and weeds
- 3 2 1 0 2. Describe standards used in USDA Grain Grading

A. Lab Activities (CD)

- 3 2 1 0 1. Identify noxious weeds and their seeds
- 3 2 1 0 2. Identify restricted weeds and their seeds
- 3 2 1 0 3. Identify common weeds and their seeds
- 3 2 1 0 4. Identify forage crops and their seeds
- 3 2 1 0 5. Identify grain crops and their seeds
- 3 2 1 0 6. Perform USDA Grain Grading (AM)
- 3 2 1 0 7. Perform seed analysis

XIII. Taxes

- 3 2 1 0 1. Identify common forms used in farm tax preparation
- 3 2 1 0 2. Define common terms used in tax planning
- 3 2 1 0 3. Identify the components of a schedule F
- 3 2 1 0 4. Explain the importance of record keeping in farm tax planning
- 3 2 1 0 5. Define terms related to depreciation
- 3 2 1 0 6. Explain issues relating to end of year farm tax planning
- 3 2 1 0 7. Locate tax resources and forms on the Internet

A. Lab Activities (E)

- 3 2 1 0 1. Fill out a Form 1040 (AM)
- 3 2 1 0 2. Fill out a Schedule F (AM)
- 3 2 1 0 3. Calculate Depreciation (AM)

XIV. 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)

XV. 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)

XVI. Other Career Development Skills (CD)

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

XVII. 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)