Horticulture
Kansas Agricultural Education

Hours Completed _____ Competencies Completed _____/148
Verification Signatures:

Student:_____ Date: _____

Instructor:_____ Date: _____

Name: _____

Instructor: _____ School Year:_____

Key to Integrated Competencies
(CD)- Career Development
(L)- Leadership
(E) - Experienced Based
(LK) - LifeKnowledge Lessons
(LA) – Language Arts
(M) - Math
(S) – Science
(SS) – Social Science

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

Horticulture Industry and Careers

3 2 1 0 1. Identify career opportunities in horticulture and the green industry career pathway (CD) (LK HS 123)
3 2 1 0 2. Explain the impact of horticulture on the local economy (SS, LA)
3 2 1 0 3. List the level of education for careers in the horticulture field (CD) (LK HS 40)
3 2 1 0 4. Identify workplace skills necessary for a horticulture career (CD)
3 2 1 0 5. Complete a job application, resume, cover letter and interview for a horticulture related career (CD,L,E) (LK HS 36)
3 2 1 0 6. Utilize the steps of the scientific method on a horticulture experiment (S:1.1.2, 1.1.3, 1.1.4)

Occupational and Personal Safety

3 2 1 0 1. Interpret Data from a chemical label (S)
3 2 1 0 2. Describe the purpose and information that is contained in a Materials Safety Data Sheet (MSDS) (LA, CD) (LK MS 9)
3 2 1 0 3. Demonstrate and use proper lifting techniques for heavy materials (E, CD)
3 2 1 0 4. Describe common safety practices and uses for power equipment in horticulture (CD, LA)
3 2 1 0 5. Identify common hazards associated with the horticulture industry (cleanliness)
3 2 1 0 6. Identify potential safety hazards when using objects with sharp and pinch points

Plant Taxonomy

3 2 1 0 1. Explain the history of scientific nomenclature (S:3.7.5, LA)
3 2 1 0 2. Classify plants using the binomial system (S:3.7.5)
3 2 1 0 3. List plant identification characteristics

Plant Structures

3 2 1 0 1. Identify parts of a cell (S:3.1.1)
3 2 1 0 2. Identify parts of monocot and dicot seeds (S)
3 2 1 0 3. Differentiate between monocot and dicot seeds (S)
3 2 1 0 4. Dissect a monocot and a dicot seed (S)
3 2 1 0 5. Describe the function of and distinguish between different root systems: Tap & Fibrous (S: 3.1.5)
3 2 1 0 6. Dissect at least one root system (S: 3.1.5, E)
3 2 1 0 7. Identify and discuss the purpose of specialized roots; tuberous, adventitious (S: 3.1.5, LA)
3 2 1 0 8. Describe the function of stems (S: 3.1.5, LA)
3 2 1 0 9. Identify the different stem forms and specialize stems bulb, corms, spurs, tubers, stolons & rhizomes (S: 3.1.5)
3 2 1 0 10. Dissect a monocot and a dicot stem (S: 3.1.5, E)
3 2 1 0 11. Describe the function of leaves (S: 3.1.5, LA)
3 2 1 0 12. Label the internal and external parts of a leaf (S: 3.1.5)
3 2 1 0 13. Distinguish between different leaf shapes, arrangements, venations and margins (S: 3.1.5)
3 2 1 0 14. List the functions of a flower (S: 3.1.5)
3 2 1 0 15. Identify parts of a complete and an incomplete flower (S: 3.1.5)
3 2 1 0 16. Explain the functions of each part of a flower (S: 3.1.5, LA)
3 2 1 0 17. Define and give examples of monoecious and dioecious plants (S: 3.1.5, LA)
3 2 1 0 18. Explain the functions of a fruit (S: 3.1.5, LA)
3 2 1 0 19. Dissect a fruit (S: 3.1.5, E)

Plant Growth Processes

3 2 1 0 1. Explain and describe the process of photosynthesis (S: 3.1.4, LA)
3 2 1 0 2. Explain the environmental factors that affect photosynthesis (S: 3.5.2, LA)
3 2 1 0 3. Describe the process of respiration (S: 3.5.3, LA)
3 2 1 0 4. Explain the environmental factors that affect respiration (S, LA)
3 2 1 0 5. Explain the processes of translocation and transpiration (S, LA)
3 2 1 0 6. Explain the environmental factors that affect transpiration (S, LA)
3 2 1 0 7. Discuss the process of nutrient absorption (S, LA)

3 2 1 0 8. Relate environmental factors that affect plant growth (S)
3 2 1 0 9. Describe geotropism and photoperiodism in horticulture (S, LA)
3 2 1 0 10. List plant growth regulators used in horticulture (S)
3 2 1 0 11. Explain how plant growth regulators affects the activity of plant metabolism (S, LA)
3 2 1 0 12. Predict and manipulate the results of photoperiodism and plant growth regulators (S)
3 2 1 0 13. Utilize USDA Hardiness Zones in plant selection (SS, E)

Soils and Soil Fertility

3 2 1 0 1. Identify and explain the purpose of each of the four soil compositions: Oxygen, Water, Particles, Organic Matter (LA)
3 2 1 0 2. Identify the three soil particles: sand, silt, clay and use the soil texture triangle
3 2 1 0 3. Describe the methods of building soil fertility (LA)
3 2 1 0 4. Explain purposes of nutrients for plant growth (LA)
3 2 1 0 5. Explain the soil sampling process (LA)
3 2 1 0 6. List and differentiate between the macro and micro nutrients (S: 2A.2.2, LA)
3 2 1 0 7. Describe how pH affect plants (S: 2A.3.3, LA)
3 2 1 0 8. Perform soil tests and interpret results (E)
3 2 1 0 9. Formulate the proper mix of fertilizers (M, E)

Plant Genetics

3 2 1 0 1. Explain the relationship between DNA, genes and alleles (S:3.2.1, LA)
3 2 1 0 2. Identify dominant and recessive genes and homozygous and heterozygous combinations (S:3.2.1, 3.2.3)
3 2 1 0 3. Apply fundamentals of Mendalian genetics (S: 3.2.1, 3.2.3)
3 2 1 0 4. Predict genotypic and phenotypic combinations using a punnet square (S: 3.2.1, 3.2.3)
3 2 1 0 5. Identify biotechnology applications in the Horticulture industry (M, S: 5.1.1)
3 2 1 0 6. Differentiate between mitosis and meiosis cell division (S: 3.2.4)

Plant Propagation

3 2 1 0 1. Discuss the difference between asexual and sexual propagation (S, LA)
3 2 1 0 2. Describe the process of pollination and other factors that impact it (S, LA)
3 2 1 0 3. Differentiate between self-fertilization and cross-fertilization (S: 3.2.4)
3 2 1 0 4. Name the requirements for seed germination and growth
3 2 1 0 5. Test and calculate seed germination percentage (M)
3 2 1 0 6. List methods of asexual reproduction
7. Perform asexual propagation by the following methods:
3 2 1 0 a. Leaf & Leaf bud cuttings (E)
3 2 1 0 b. Herbaceous, softwood, semi-hardwood & hardwood stem cutting (E)
3 2 1 0 c. Root cutting (E)
3 2 1 0 d. Separation of bulbs, corms, tubers, tuberous roots & rhizomes (E)
3 2 1 0 8. Describe the application of advanced propagation techniques: grafting, patch and T budding, mound and air layering, micro propagation and tissue culture (S: 5.1.1, LA)

Weed, Disease, and Pest Control

3 2 1 0 1. Identify weed, disease, and pest damage (E)
3 2 1 0 2. Show diseased material handling techniques
3 2 1 0 3. Demonstrate how to mix pesticides (M, E)

General Greenhouse Practices

3 2 1 0 1. Demonstrate proper methods of potting and transplanting mature plants (E)
3 2 1 0 2. Demonstrate proper methods of using rooting hormones (E)
3 2 1 0 3. Demonstrate proper methods of sowing seeds (E)
3 2 1 0 4. Demonstrate proper methods of transplanting seedling or cuttings (E, CD)
3 2 1 0 5. Demonstrate proper methods of pinching and plants and flowers (E, CD)
3 2 1 0 6. Demonstrate proper methods of fertilizer application (E, CD)
3 2 1 0 7. Demonstrate proper methods of watering (E)
3 2 1 0 8. Identify basic types and sizes of containers used in commercial greenhouses (CD, E)

Nursery and Landscape Industry

3 2 1 0 1. Explain proper turf care and maintenance (LA)
3 2 1 0 2. Explain proper shrub/tree care pruning and maintenance (LA)
3 2 1 0 3. Install plant materials into a landscape (E, CD)
3 2 1 0 4. Identify basic landscape design principles
3 2 1 0 5. Identify 10 trees – deciduous or evergreen
3 2 1 0 6. Identify 10 shrubs – deciduous or evergreen
3 2 1 0 7. Identify 3 grasses – cool or warm season
3 2 1 0 8. Identify 5 groundcovers

Floriculture Industry

3 2 1 0 1. Identify basic tools and materials used in floriculture and the greenhouse
3 2 1 0 2. Identify basic principles of floral arranging and elements of design
3 2 1 0 3. Identify color relationships
3 2 1 0 4. Construct a finished floriculture product using design principles (E, CD)
3 2 1 0 5. List the different floral design forms
3 2 1 0 6. Identify 10 foliage plants
3 2 1 0 7. Identify 10 florist crops
3 2 1 0 8. Identify 10 bedding plants

Vegetable Gardening

3 2 1 0 1. Describe the amount of water and space each plant should have (M)
3 2 1 0 2. Develop a home garden plan (M, E)

3 2 1 0 3. Identify the difference between a fruit and a vegetable
3 2 1 0 4. Describe the benefits of a home garden
3 2 1 0 5. Analyze organic versus nonorganic gardening methods
3 2 1 0 6. Identify 5 perennials or bulbs (CD)
3 2 1 0 7. Identify 10 fruits or vegetables (CD)

Horticulture Math

3 2 1 0 1. Utilize area, perimeter, and volume calculations (M)
3 2 1 0 2. Demonstrate proper measuring techniques (M, E, CD)
3 2 1 0 3. Create drawings to scale (M, E, CD)
3 2 1 0 4. Calculate materials needed for proper greenhouse and landscape applications-ex. amount of media for pots and plant (M, E, CD)
3 2 1 0 5. Demonstrate proper mathematical conversions (M)

Opportunities in the FFA

3 2 1 0 1. Research and present a 3-5 minute speech on an agricultural topic.(LK HS 90) (L, LA)
3 2 1 0 2. Serve on a POA committee.(LK AHS 45) (L)
3 2 1 0 3. Participate in a local chapter activity. (L)
3 2 1 0 4. Demonstrate how to conduct an engaging chapter meeting. (LK AHS 47) (L)
3 2 1 0 5. Identify and relate the benefits of FFA to his/her education and personal goals. (L)

SAE

3 2 1 0 1. Maintain records on income and expense.(LK MS 69) (M, CD, E)
3 2 1 0 2. Complete a cash flow statement. (M, CD, E)
3 2 1 0 3. Complete year-end records.(M, CD, E)
3 2 1 0 4. Complete a SAE packet.(LK AHS 53)

Work Place Skills

Resource Management

3 2 1 0 1. Locate information and select the materials, tools, and equipment needed to perform an activity or build a project.(CD)
3 2 1 0 2. Determine cost, time, and resources needed to complete a task within an industry or occupation.(CD)
3 2 1 0 3. Explain the relationship between setting goals and managing money. (CD,LK AHS 9)
3 2 1 0 4. Identify fixed a flexible expenses.
3 2 1 0 5. Identify planned and impulse buying.

Worth Ethics

1. Interpret workplace policies related to: (CD)
   - 3 2 1 0 a. Safety
   - 3 2 1 0 b. Personal hygiene
   - 3 2 1 0 c. Absence and personal leave
   - 3 2 1 0 d. Substance abuse
   - 3 2 1 0 e. Employee theft
   - 3 2 1 0 f. Sexual harassment
   - 3 2 1 0 g. Termination/Legal actions
   - 3 2 1 0 h. Punctuality and dependability
   - 3 2 1 0 i. Responsibility for position
   - 3 2 1 0 j. Accuracy
   - 3 2 1 0 k. Cost effectiveness
2. Understand and value effective work ethic attitudes and behaviors such as: (CD, L)
   - 3 2 1 0 a. Acceptance of the job requirement
   - 3 2 1 0 b. A willingness to take initiative with new challenges
   - 3 2 1 0 c. Take responsibility for decision and actions.

3 2 1 0 1. Compare and complete various examples of job application forms (CD, LA)
3 2 1 0 2. Demonstrate personal characteristics that lead to job satisfaction.
3 2 1 0 3. Maintain an opening to lifelong learning.
3 2 1 0 4. Create a portfolio or resume' or other means that display academic and technical skill and accomplishments. (E, LA, CD)

Mathematics

3 2 1 0 1. Estimate, apply and solve problems involving fraction, decimals, percentages, and real numbers. (M)
3 2 1 0 2. Decide whether a problem situation is best solved using computer, calculator, paper and pencil, or mental arithmetic/estimation techniques.(M)
3 2 1 0 3. Translate written and /or verbal statements into mathematical expressions.(M, LA)
3 2 1 0 4. Convert common units of measurement within and /or across measurement systems (metric/English, etc.).(M)
3 2 1 0 5. Construct and interpret tables, charts, maps, and/or graphs.(M)
3 2 1 0 6. Apply measurement concepts of distance, direction, rate, time, and acceleration.(M)
3 2 1 0 7. Interpret measures of central tendency mean, median, mode, and variance.(M)