**AGRICULTURE, FOOD & NATURAL RESOURCES CAREER CLUSTER DESIGN:**

**Agriculture Science Pathway**

***CHECKLIST*:** ***Horticulture* (18052)**

|  |  |  |
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| **Standard** | **Dates Taught** | **Notes** |
| **Horticulture Industry and Careers** |
| 1. Identify career opportunities in horticulture and the green industry career pathway
 |  |  |  |  |  |
| 1. Explain the impact of horticulture on the local economy
 |  |  |  |  |  |
| 1. List the level of education for acareers in the horticulture field
 |  |  |  |  |  |
| 1. Identify workplace skills necessary for a horticulture career
 |  |  |  |  |  |
| 1. Complete a job application, resume, cover letter and interview for a horticulture related career
 |  |  |  |  |  |
| 1. Utilize the steps of the scientific method ona horticulture experiment
 |  |  |  |  |  |
| **Occupational and Personal Safety** |
| 1. Interpret Data from a chemical label
 |  |  |  |  |  |
| 1. Describe the purpose and information that is contained in a Materials Safety Data Sheet
 |  |  |  |  |  |
| 1. Demonstrate and use proper lifting techniques for heavy materials
 |  |  |  |  |  |
| 1. Describe common safety practices and uses for power equipment in horticulture
 |  |  |  |  |  |
| 1. Identify common hazards associated with the horticulture industry (cleanliness)
 |  |  |  |  |  |
| 1. Identify potential safety hazards when using objects with sharp and pinch points
 |  |  |  |  |  |
| **Plant Taxonomy** |
| 1. Explain the history of scientific nomenclature
 |  |  |  |  |  |
| 1. Classify plants using the binomial system
 |  |  |  |  |  |
| 1. List plant identification characteristics.
 |  |  |  |  |  |

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| **Plant Structures (#1)** |
| 1. Identify parts of a cell
 |  |  |  |  |  |
| 1. Identify parts of monocot and dicot seeds
 |  |  |  |  |  |
| 1. Differentiate between monocot and dicot seeds
 |  |  |  |  |  |
| 1. Dissect a monocot and dicot seed
 |  |  |  |  |  |
| 1. Describe the function of and distinguish between different root systems
 |  |  |  |  |  |
| 1. Dissect at least one root system
 |  |  |  |  |  |
| 1. Identify and discuss the purpose of specialized roots: tuberous, adventitious
 |  |  |  |  |  |
| 1. Describe the function of stems
 |  |  |  |  |  |
| 1. Identify the different stem forms and specialize stems bulb, corms, spurs, tubers, stolons & rhizones
 |  |  |  |  |  |
| 1. Dissect a monocot and a dicot stem
 |  |  |  |  |  |
| 1. Describe the functin of leaves
 |  |  |  |  |  |
| 1. Label the internal and external parts of a leaf
 |  |  |  |  |  |
| 1. Distinguish between different leaf shapes, arrangements, venations and margins
 |  |  |  |  |  |
| 1. List the functions of a flower
 |  |  |  |  |  |
| **Plant Structures (#2)** |
| 1. Identify parts of a complete and an imcomplete flower
 |  |  |  |  |  |
| 1. Explain the functions of each part of a flower
 |  |  |  |  |  |
| 1. Define and give examples of monoecious and dioecious plants
 |  |  |  |  |  |
| 1. Explain the functions of a fruit
 |  |  |  |  |  |
| 1. Dissect a fruit
 |  |  |  |  |  |

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| **Standard** | **Dates Taught** | **Notes** |
| **Plant Growth Processes** |
| 1. Explain and describe the process of photosynthesis
 |  |  |  |  |  |
| 1. Explain the environmental factors that affect photosynthesis
 |  |  |  |  |  |
| 1. Describe the process of respiration
 |  |  |  |  |  |
| 1. Explain the environmental factors that affect respiration
 |  |  |  |  |  |
| 1. Explain the processes of translocation and transpiration
 |  |  |  |  |  |
| 1. Explain the environmental facts that affect transpiration
 |  |  |  |  |  |
| 1. Discuss the process of nutrient absorption
 |  |  |  |  |  |
| 1. Relate environmental factors that affect plant growth
 |  |  |  |  |  |
| 1. Describe geotropism and photoperiodism
 |  |  |  |  |  |
| 1. List plant growth regulators
 |  |  |  |  |  |
| 1. Explain how plant growth regulators affects the activity of plant metabolism
 |  |  |  |  |  |
| 1. Predict and manipulate the results of photoperiodism and plant growth regulators
 |  |  |  |  |  |
| 1. Utilize USDA Hardiness Zones in plant selection
 |  |  |  |  |  |
| **Soils and Soil Fertility** |
| 1. Identify and explain the purpose of each of the four soild compositions: Oxygen, Water, Particles, Organic Matter
 |  |  |  |  |  |
| 1. Identify the three soil particles; sand, silt, clay and use the soil texture triangle
 |  |  |  |  |  |
| 1. Describe the methods of building soil fertility
 |  |  |  |  |  |
| 1. Explain purposes of nutrients for plant growth
 |  |  |  |  |  |
| 1. Explain the soil sampling process
 |  |  |  |  |  |
| 1. List and differentiate between the macro and micro nutrients
 |  |  |  |  |  |
| 1. Describe how pH affect plants
 |  |  |  |  |  |
| 1. Perform soil tests and interpret results
 |  |  |  |  |  |
| 1. Formulate the proper mix of fertilizers
 |  |  |  |  |  |

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| **Plant Genetics** |
| 1. Explain the relationship between DNA, genes, and alleles
 |  |  |  |  |  |
| 1. Identify cominant and recessive genes and homozygous and heterozygoes combinations
 |  |  |  |  |  |
| 1. Apply fundamentals of Mendalian genetics
 |  |  |  |  |  |
| 1. Predict genotypic and phenotypic combinations using punnet square
 |  |  |  |  |  |
| 1. Identify biotechnology applications in the Horticulture industry
 |  |  |  |  |  |
| 1. Differentiate between mitosis and meiosis cell division
 |  |  |  |  |  |
| **Plant Propagation** |
| 1. Discuss the difference between asexual and sexual propagation
 |  |  |  |  |  |
| 1. Describe the process of pollination and other factors that impact it
 |  |  |  |  |  |
| 1. Differentiate between self-fertilization and cross-fertilization
 |  |  |  |  |  |
| 1. Name the requirements for seed germination and growth
 |  |  |  |  |  |
| 1. Test and calculate seed germination
 |  |  |  |  |  |
| 1. List methods of asexual reproduction
 |  |  |  |  |  |
| 1. Perform asexual propagation by the following methods:
 |  |  |  |  |  |
| 1. Leaf & Leaf bud cuttings
 |  |  |  |  |  |
| 1. Herbaceous, softwood, semi-hardwood & hardwood stem cutting
 |  |  |  |  |  |
| 1. Root cutting
 |  |  |  |  |  |
| 1. Separation of bulbs, corms, tubers, tuberous roots & rhizomes
 |  |  |  |  |  |
| 1. Describe the application of advanced propagation techniques: grafting, path and T budding, mound and air layering,micro propagation and tissue culture
 |  |  |  |  |  |

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| **Standard** | **Dates Taught** | **Notes** |
| **Weed, Disease, and Pest Control** |
| 1. Identify weed, disease, and pest damage
 |  |  |  |  |  |
| 1. Show diseased material handling techniques
 |  |  |  |  |  |
| 1. Demonstrate how to mix pesticides
 |  |  |  |  |  |
| **General Greenhouse Practices** |
| 1. Demonstrate proper methods of potting and transplanting mature plants
 |  |  |  |  |  |
| 1. Demonstrate proper methods of using rooting hormones
 |  |  |  |  |  |
| 1. Demonstrate proper methods of sowing seeds
 |  |  |  |  |  |
| 1. Demonstrate proper methods of transplanting seedling or cuttings
 |  |  |  |  |  |
| 1. Demonstrate propermethods of pinching and plants and flowers
 |  |  |  |  |  |
| 1. Demonstrate methods of fertilizer application
 |  |  |  |  |  |
| 1. Demonstrate proper methods of watering
 |  |  |  |  |  |
| 1. Identify basic types and sizes of containers used incommercial greenhouses
 |  |  |  |  |  |
| **Nursery and Landscape Industry** |
| 1. Explain proper turf care and maintenance
 |  |  |  |  |  |
| 1. Explain proper shrub/tree care pruning & maintenance
 |  |  |  |  |  |
| 1. Install plant materials into a landscape
 |  |  |  |  |  |
| 1. Identify basic landscape design
 |  |  |  |  |  |
| 1. Identify 10 trees (deciduous or evergreen)
 |  |  |  |  |  |
| 1. Identify 10 shrubs (deciduous or evergreen)
 |  |  |  |  |  |
| 1. Identify 3 grasses (cool or warm season)
 |  |  |  |  |  |
| 1. Identify 5 groundcovers
 |  |  |  |  |  |

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| **Standard** | **Dates Taught** | **Notes** |
| **Floriculture Industry** |
| 1. Identify basic tools and materials used in floriculture and the greenhouse
 |  |  |  |  |  |
| 1. Identify basic principles of floral arranging and elements of design
 |  |  |  |  |  |
| 1. Identify color relationships
 |  |  |  |  |  |
| 1. Construct a finished floriculture product using design principles
 |  |  |  |  |  |
| 1. List the different floral design forms
 |  |  |  |  |  |
| 1. Identify 10 foliage plants
 |  |  |  |  |  |
| 1. Identify 10 florist crops
 |  |  |  |  |  |
| 1. Identify 10 bedding plants
 |  |  |  |  |  |
| **Vegetable Gardening** |
| 1. Describe the amount of water and space each plant should have
 |  |  |  |  |  |
| 1. Develop a home garden plan
 |  |  |  |  |  |
| 1. Identify the difference between a fruit and a vegetable
 |  |  |  |  |  |
| 1. Describe the benefits of a home garden
 |  |  |  |  |  |
| 1. Analyze organic versus nonorganic gardening methods
 |  |  |  |  |  |
| 1. Identify 5 perennials or bulbs
 |  |  |  |  |  |
| 1. Identify 10 fruits or vegetables
 |  |  |  |  |  |
| **Horticulture Math** |
| 1. Utilize area, perimeter, and volume calculations
 |  |  |  |  |  |
| 1. Demonstrate proper measuring techniques
 |  |  |  |  |  |
| 1. Create drawings to scale
 |  |  |  |  |  |
| 1. Calculate materials needed for proper greenhouse and landscape applications
 |  |  |  |  |  |
| 1. Demonstrate proper mathematical conversions
 |  |  |  |  |  |