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

**Agriculture Science Pathway**

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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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| **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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| **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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| **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 |  |  |  |  |  |