

# Floriculture



# CDE Handbook

# **FLORICULTURE**

**New for 2021**

## **1. Purpose**

The Floriculture CDE is designed to create an interest in career preparation for all current and future aspects of the Floriculture industry.

## **2. Objectives**

- a. Identify plant materials, supplies, and equipment utilized in the industry.
- b. Demonstrate the principles of design and develop related skills.
- c. Demonstrate interpersonal skills necessary for successful employment in the industry.

## **3. Rules**

- a. **Each chapter may enter up to four participants. The team score will include all four scores.**
- b. Under no circumstances will any participant be allowed to touch or handle plant materials during the event except in the practicum. Any violation of this rule will result in the participant's disqualification.
- c. No team, team member, or team coach shall visit the event facilities to observe plant materials a week prior to the event. Any team, team member or team coach reported and proven to do so will cause the disqualification of that team.
- d. Students will use Universal Form C #705C-1 for most practicums. Any participant caught cheating will be dismissed from that phase of the event.
- e. To facilitate the holding of scorecards during the event, participants are urged to bring and use clean un-marked clipboards. All participants must bring their own #2 hardness lead pencil(s).

## **4. Format**

- a. Plant/Equipment Identification – **National FFA list(s) adopted in 2021.**
  1. Sixty specimens (50 plants and 10 equipment) from the Floral ID and Equipment ID lists will be displayed to be identified. Each specimen will be designated by a number.
  2. This section is split into two rotations with each having 30 specimens for identification. Participants will be allowed 30 minutes to complete each section.  
**Maximum time of one minute per specimen to identify.**
  3. No plants or equipment may be touched or handled in any way.
  4. Five points will be awarded for each specimen that is correctly identified. (Total 300 points.)
  5. Universal Form C will be used to record answers.
- b. Customer Assistance/Sales Practicum
  1. This practicum in interpersonal relations is designed to evaluate the participant's knowledge and ability in verbal communications, salesmanship, customer relations, and completion of business forms and knowledge of plant materials, floral selection and design.

2. Individuals will be provided an order form plus any other materials appropriate for the practicum.
3. The participant will assume the role of an employee of a small flower shop/greenhouse - "Campus Florals". An event official will assume the role of a customer desiring to place an order. Interaction between the employee and the customer may be by telephone or face to face by "point of sale" definition. At the point of sale, the merchant calculates and indicates the amount owed, prepares an invoice, and indicates the options for the customer to make payment. Limited information will be provided by the customer upon placing the order, the remaining required information must be gathered through interaction with the customer.
4. A maximum of five minutes will be allowed for taking the order. An additional five minutes may be used for completion of the order form.
5. The order form will be the only material used. Participants will use the "Campus Florals" order form. The resulting written order form will be evaluated and scored as a part of this phase.
6. This practicum is worth 100 points.
7. Each rotation will have 30 minutes.

c. Corsage and Boutonniere Practicum

1. Participants will be given thirty (30) minutes in which to complete a corsage and matching/complimentary boutonniere.
2. All plant and non-plant materials needed to complete these practicums shall be provided.
3. The corsage shall be three miniature carnations and must have a bow or other such appropriate condiments. This corsage should be of the design to be worn or pinned on a dress.
4. The completed corsage should be placed in the corsage box with the corsage scorecard.
5. The corsage is worth 100 pts.
6. The boutonniere shall be a single large flower carnation with appropriate condiment and no ribbon should be used.
7. The completed boutonniere should be placed in a plastic bag with the boutonniere scorecard and pin the bag. Participants are not to mist or seal the bag.
8. The boutonniere is worth 100 pts.

d. Written Test

1. Fifty objective type multiple-choice questions will be selected from the areas on the following list:

1. Plant Materials	2. Planting or Growing Media	3. Diagnosis of Plant Disorders	4. Materials: growth regulators, fertilizer, etc.
5. Propagation	6. Safety	7. Cultural Instructions	8. Floral marketing

2. This phase of the event will test knowledge and understanding of the basic principles relating to the following areas of horticulture (for example: questions for the plant materials area may deal with such features as anatomy of a flower or leaf, physiology of specific types of plants important to the horticulture industry, etc.).
3. Individuals will be allowed 30 minutes to complete this phase.
4. Each answer has a value of 4 points for a total of 200 points.

e. Problem Solving

1. Each participant will solve 10 problems related to the various aspects of the floriculture industry using commonly accepted standards and available information to solve a problem specific to a particular area of floriculture production or retailing.
2. See the National FFA Career Development Events Guide for examples.
3. Participants will be allowed 30 minutes to complete this phase.
4. Each correct solution has a value of 10 points for a total of 100 points

### 5. Scoring

Part	Minutes/Part	Individual Points	Team Points
Written Test	30	200	800
Problem Solving	30	100	400
Corsage & Boutonniere	30	200	800
Customer assistance/sales	30	100	400
Plant/Equipment ID	60	300	1200
<b>Total</b>	180	900	3600

### 6. Awards

a. Individual

1. Individual scores will be tabulated and broken into gold, silver, and bronze award areas.
2. Individual ties will not be broken.
3. The high individual receives the “baby bison” trophy. A \$100 stipend is awarded by the ND FFA Foundation.

b. Team

1. Team scores will be tabulated by adding the four-member scores. They will be broken into gold, silver, and bronze.
2. The high team shall be eligible to represent North Dakota in the National FFA Floriculture career development event. The high team receives the Traveling Trophy and travel stipends from the ND FFA Foundation to participate in the National Event.
3. Team Tie Breakers: 1. Team Plant ID; 2. Team Written Exam Score; 3. Corsage Team Score.

### 7. Resources

- c. National FFA Floriculture CDE Handbook.

### **SAMPLE CUSTOMER SERVICE/SALES ORDER PROBLEMS**

1. A single sided arrangement for a 14-year-old boy in the hospital with a broken leg from a football game.
2. A small tabletop arrangement for a coffee table, to be used at a spring meeting of the neighborhood social committee.
3. A full arrangement to be used at the dinner table for Thanksgiving.
4. A small funeral arrangement for an elderly acquaintance.
5. An end-table arrangement for the Christmas season.
6. A friendship arrangement for a classmate.
7. A Valentine arrangement for a Grandmother living in a retirement home.
8. A "bunch" of roses for a spouse on their birthday.
9. A Mother's Day arrangement.
10. Long-stem roses for a high school coronation.
11. A corsage for a prom date.
12. An alter arrangement for the church Easter services.

### **EXAMPLE CUSTOMER SERVICE/SALES PROBLEM**

Information given when placing the order

1. Arrangement is needed for presentation to the Queen at a High School Homecoming Coronation.
2. Price range is \$20-\$25.

Information to be provided through questions

1. Location of the coronation - Anytown High School, 1111 11th Ave. North, Fargo
2. Date - June 15, 1:30 pm
3. Delivery - by 1:00 pm
4. School Colors - Blue, Yellow and White
5. School Logo - Rockets
6. Flower Preference - Mums and Carnations
7. Type of Arrangement - Single sided
8. Card - "Congratulations from the Anytown Alumni!"
9. Billing - Credit Card Number 0123 4321 6789 6543 or other payment by the point of sale.

Frank Smith, Box 222, Fargo, ND 58100 - Phone - 237-7777

Information Given to the Participant

1. Greenhouse - "Campus Florals"
2. Location - North Fargo
3. Delivery policy - free in-town delivery
4. Pricing - All prices include applicable taxes
5. Flowers available - Pom Pom Mum, Spider Mum, Daisy, Gladioli, Carnation, Rose.



NORTH DAKOTA

# Floriculture Plant Identification List

101	<i>Aechmea fasciata</i> cv.	Silver Vase Bromeliad	138	<i>Dianthus caryophyllus</i> cv.	Carnation
102	<i>Ageratum houstonianum</i>	Ageratum	139	<i>Dracaema cincta</i>	Red Edge Dracaena
103	<i>Alstroemeria</i> hybrid cv.	Peruvian Lily	140	<i>Echinocactus</i> cv.	Barrel Cactus
104	<i>Anemone coronaria</i>	Anemone	141	<i>Epipremnum aureum</i> cv.	Golden Pothos
105	<i>Anethum graveolens</i> cv.	Dill	142	<i>Erica carnea</i> cv.	Spring Heather
106	<i>Angelonia</i> hybrid cv.	Angelonia	143	<i>Eucalyptus polyanthemos</i>	Silver Dollar Eucalyptus
107	<i>Anthurium x andraeanum</i> cv.	Flamingo Plant	144	<i>Euphorbia pulcherrima</i> cv.	Poinsettia
108	<i>Antirrhinum majus</i> cv.	Snapdragon	145	<i>Eustoma grandiflorum</i>	Lisianthus
109	<i>Aphelandra squarrosa</i> cv.	Zebra Plant	146	<i>Exacum affine</i>	Persian Violet
110	<i>Araucaria heterophylla</i>	Norfolk Island Pine	147	<i>Ficus benjamina</i> cv	Benjamin Fig
111	<i>Asparagus densiflorus</i>	Sprengeri Fern	148	<i>Ficus elastica</i> cv	Rubber Plant
112	<i>Aster pringlei</i>	Monte Cassino Aster	149	<i>Fragaria x ananassa</i> cv	Strawberry Plant
113	<i>Astilbe</i> hybrid cv.	Astilbe	150	<i>Freesia x hybrida</i>	Freesia
114	<i>Begonia x semperflorens - cultorum</i>	Wax Begonia	151	<i>Gardenia jasminoides</i>	Gardenia
115	<i>Begonia x tuberhybrida</i> cv.	Tuberous Begonia	152	<i>Gerbera jamesonii</i>	Gerbera Daisy
116	<i>Caladium x hortulanum</i> cv.	Caladium	153	<i>Gladiolus x hortulanus</i> cv.	Garden Gladiolus
117	<i>Calibrachoa</i> hybrid cv.	Million Bells	154	<i>Gomphrena</i> hybrid cv.	Globe Amaranths
118	<i>Callistephus chinensis</i> cv.	China Aster	155	<i>Gypsophila elegans</i> cv.	Baby's Breath
119	<i>Campanula</i> hybrid cv	Campanula	156	<i>Hedera helix</i> cv	English Ivy
120	<i>Canna x generalis</i> cv.	Garden China	157	<i>Helianthus annuus</i>	Sunflower
121	<i>Capsicum annuum</i>	Ornamental Pepper Plant	158	<i>Hemerocallis</i> cv.	Daylily
122	<i>Catharanthus roseus</i>	Vinca	159	<i>Hippeastrum</i> hybrid cv	Amaryllis
123	<i>Celosia argentea</i> cv.	Cockscomb	160	<i>Hosta</i> cv.	Hosta
124	<i>Chamaedorea elegans</i>	Parlor Palm	161	<i>Hoya carnososa</i>	Wax Plant
125	<i>Chamelaucium uncinatum</i>	Waxflower	162	<i>Hyacinthus orientalis</i> cv.	Hyacinth
126	<i>Cholorophytum comosum</i> cv.	Spider Plant	163	<i>Hydrangea macrophylla</i>	Big Leaf Hydrangea
127	<i>Chrysanthemum x morifolium</i>	Florist's Chrysanthemum	164	<i>Impatiens</i> hybrid cv.	Impatiens
128	<i>Clematis</i> hybrid cv.	Clematis	165	<i>Impomoea batatas</i> cv.	Ornamental Sweet Potato
129	<i>Codiaeum variegatum pictum</i>	Croton	166	<i>Iris x xiphium</i> cv.	Dutch Iris
130	<i>Crassula argentea</i>	Jade Plan	167	<i>Senecio cineraria</i>	Dusty Miller
131	<i>Cycas revoluta</i> cv.	Sago Palm	168	<i>Justica brandegeana</i>	Shrimp Plant
132	<i>Cyclamen x persicum</i> cv.	Florist's Cyclamen	169	<i>Kalanchoe x blossfeldiana</i> cv	Kalanchoe
133	<i>Cymbidium</i> cv.	Cymbidium Orchid	170	<i>Leucanthemum x superbum</i>	Shasta Daisy
134	<i>Cymbopogon</i> cv.	Lemongrass (herb)	171	<i>Leucospermum</i> hybrid cv.	Pin Cushion Protea
135	<i>Dahlia</i> hybrid cv.	Dahlia	172	<i>Liatris spicata</i>	Liatris
136	<i>Delphinium consolida</i> cv.	Larkspur	173	<i>Lilium</i> hybrid cv.	Asiatic or Oriental Lily
137	<i>Dendrobium</i> cv.	Dendrobium Orchid	174	<i>Limonium sinuatum</i>	Statice

175	<i>Lobularia maritima</i>	<i>Alyssum</i>	198	<i>Rumohra adiantiformis</i>	<i>Leatherleaf Fern</i>
176	<i>Maranta leuconeura</i>	<i>Prayer Plant</i>	199	<i>Saintpaulia ionantha cv.</i>	<i>African Violet</i>
177	<i>Matthiola incana cv.</i>	<i>Stock</i>	200	<i>Salvia splendens cv.</i>	<i>Salvia</i>
178	<i>Monstera deliciosa</i>	<i>Split Leaf Philodendron</i>	201	<i>Sansevieria trifasciata cv.</i>	<i>Snake Plant</i>
179	<i>Narcissus hybrid cv.</i>	<i>Daffodil or Narcissus</i>	202	<i>Schefflera arboricola</i>	<i>Dwarf Schefflera</i>
180	<i>Nephrolepis exaltata cv.</i>	<i>Boston Fern</i>	203	<i>Schlumbergera bridgesii</i>	<i>Christmas Cactus</i>
181	<i>Ocimum basilicum cv.</i>	<i>Basil</i>	204	<i>Sempervivum hybrid cv.</i>	<i>Hens and Chicks</i>
182	<i>Opuntia cv.</i>	<i>Cactus</i>	205	<i>Senecio x hybridus cv.</i>	<i>Cineraria</i>
183	<i>Paeonia cv.</i>	<i>Peony</i>	206	<i>Sinningia speciosa Fyfiana Group cv.</i>	<i>Florist Gloxinia</i>
184	<i>Paphiopedilum hybrid cv.</i>	<i>Ladyslipper Orchid</i>	207	<i>Solidago hybrid cv</i>	<i>Solidago</i>
185	<i>Pelargonium x hortorum cv.</i>	<i>Zonal Geranium</i>	208	<i>Solenostemon scutellarioides</i>	<i>Coleus</i>
186	<i>Pelargonium peltatum cv.</i>	<i>Ivy Geranium</i>	209	<i>Spathiphyllum</i>	<i>Peace Lily</i>
187	<i>Pentas hybrid cv.</i>	<i>Pentas</i>	210	<i>Stephanotis floribunda</i>	<i>Stephanotis</i>
188	<i>Petroselinum crispum cv.</i>	<i>Parsley</i>	211	<i>Strelitzia reginae</i>	<i>Bird of Paradise</i>
189	<i>Petunia x hybrida cv.</i>	<i>Petunia</i>	212	<i>Syngonium podophyllum</i>	<i>Nephtytis</i>
190	<i>Phalaenopsis cv.</i>	<i>Moth Orchid</i>	213	<i>Tagetes species cv.</i>	<i>Marigold</i>
191	<i>Philodendron scandens oxycardium</i>	<i>Heartleaf Philodendron</i>	214	<i>Tradescantia zebrine</i>	<i>Wandering Jew</i>
192	<i>Pilea cadierei</i>	<i>Aluminum Plant</i>	215	<i>Tulipa cv.</i>	<i>Tulip</i>
193	<i>Portulaca oleracea cv.</i>	<i>Portulaca</i>	216	<i>Verbena hybrid cv.</i>	<i>Verbena</i>
194	<i>Primula malacoides cv.</i>	<i>Primrose</i>	217	<i>Viola x wittrockiana cv.</i>	<i>Pansy</i>
195	<i>Ranunculus hybrid cv.</i>	<i>Ranunculus</i>	218	<i>Zantedeschia hybrid cv.</i>	<i>Calla Lily</i>
196	<i>Rhododendron simsii cv.</i>	<i>Florist Azalea</i>	219	<i>Zinnia cv.</i>	<i>Zinnia</i>
197	<i>Rosa hybrid cv</i>	<i>Hybrid Tea Rose</i>			



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# Floriculture Equipment and Supply Identification List

001	#100 Ribbon (satin, sheer, wired)
002	#3 Ribbon (satin, sheer, wired)
003	#40 Ribbon (satin, sheer, wired)
004	#9 Ribbon (satin, sheer, wired)
005	18-Gauge floral wire
006	28-Gauge floral wire
007	Anvil-and-blade pruner
008	Backflow preventer
009	Bouquet sleeve
010	Bulb planter
011	Cardette
012	Cell pack containers
013	Ceramic container
014	Chemical resistant gloves
015	Chenille stem
016	Coconut coir
017	Compressed air sprayer
018	Corsage box
019	Corsage pin
020	Corsage snips
021	Drip emitter, irrigation
022	Dry foam
023	Dust mask
024	Duster
025	Ellepot propagation cubes
026	Enclosure card
027	Fern greening pins
028	Fertilizer injectors
029	Floral adhesive
030	Floral foam
031	Floral knife
032	Floral preservative
033	Floral stem tape
034	Fogger
035	Gas mask
036	Glass vase
037	Glue gun
038	Glue pan

039	Glue sticks
040	Granular fertilizer
041	Greenhouse thermostat
042	Hanging basket
043	Hearing protection
044	Hook-and-blade pruners (bypass pruners)
045	Hose punch
046	Hose repair coupling
047	Hose-end repair fitting
048	Hose-end sprayer
049	Hose-end washer
050	Impulse sprinkler
051	Drip Irrigation tape
052	Irrigation timer
053	Mist nozzle (mist bed)
054	Nosegay holder
055	Nursery container
056	Oscillating sprinkler
057	Peat moss
058	Peat pots
059	Pest strips
060	pH testing meter
061	Polyethylene film
062	Polyethylene pipe
063	Pot covers
064	Propagation mat
065	Propagation trays
066	PVC (polyvinylchloride) pipe
067	PVC pipe cutter
068	Resin-coated fertilizer
069	Respirator
070	Ribbon shears
071	Rice hulls
072	Rockwool propagation cubes
073	Rose and stem flower stripper
074	Safety goggles
075	Sand
076	Scoop shovel

077	Shade fabric
078	Sharpening stone
079	Sheet moss
080	Siphon injector
081	Soil moisture meter
082	Solenoid valve
083	Spaghetti tubing (1/4" diameter or less)
084	Spanish moss
085	Sphagnum moss
086	Spray suit
087	Square point (flat) shovel
088	Styrofoam
089	Surestik cling
090	Tulle
091	Vermiculite
092	Water breaker
093	Water picks
094	Water soluble fertilizer
095	Water tubes
096	Waterproof container tape
097	Wire cutter
098	Wooden pick
099	Wrist corsage holder



NORTH DAKOTA





**ND FFA  
FLORICULTURE CUSTOMER ASSISTANCE  
PRACTICUM SCORE CARD**

Final Score

NORTH DAKOTA

Contestant's No.	Contestant's Name		
Chapter	Possible Points	Contestant Points	
<b>Conversation (70 points)</b>			
Approach	5		
Voice	12		
Personality	17		
Information Gathered From Customer	15		
Salesmanship	14		
Closing of Order	7		
<b>Written Order (30 points)</b>			
Delivery Instructions	4		
Descriptions of Floral Items	6		
Billing Information	6		
Card Message	4		
Neatness and Completeness	5		
Correct Computation	5		
<b>TOTAL POINTS</b>	<b>100</b>		



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FLORICULTURE CUSTOMER ASSISTANCE  
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Contestant's No.	Contestant's Name		
Chapter	Possible Points	Contestant Points	
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Information Gathered From Customer	15		
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Closing of Order	7		
<b>Written Order (30 points)</b>			
Delivery Instructions	4		
Descriptions of Floral Items	6		
Billing Information	6		
Card Message	4		
Neatness and Completeness	5		
Correct Computation	5		
<b>TOTAL POINTS</b>	<b>100</b>		



### ND FFA CORSAGE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	<b>Possible Points</b>	<b>Contestant Points</b>	
Wiring/Taping	20		
Use of Ribbon	10		
Selection of Quality of Materials	20		
Design	25		
Wearability	25		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA CORSAGE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	<b>Possible Points</b>	<b>Contestant Points</b>	
Wiring/Taping	20		
Use of Ribbon	10		
Selection of Quality of Materials	20		
Design	25		
Wearability	25		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA CORSAGE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	<b>Possible Points</b>	<b>Contestant Points</b>	
Wiring/Taping	20		
Use of Ribbon	10		
Selection of Quality of Materials	20		
Design	25		
Wearability	25		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA CORSAGE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	<b>Possible Points</b>	<b>Contestant Points</b>	
Wiring/Taping	20		
Use of Ribbon	10		
Selection of Quality of Materials	20		
Design	25		
Wearability	25		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA BOUTONNIERE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	Possible Points	Contestant Points	
Wiring/Taping	20		
Selection of Quality Materials	20		
Design	25		
Wearability	25		
Packaging	10		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA BOUTONNIERE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	Possible Points	Contestant Points	
Wiring/Taping	20		
Selection of Quality Materials	20		
Design	25		
Wearability	25		
Packaging	10		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA BOUTONNIERE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	Possible Points	Contestant Points	
Wiring/Taping	20		
Selection of Quality Materials	20		
Design	25		
Wearability	25		
Packaging	10		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			



### ND FFA BOUTONNIERE PRACTICUM SCORE CARD

		Final Score	
Contestant Number	Contestant Name		
Chapter	Possible Points	Contestant Points	
Wiring/Taping	20		
Selection of Quality Materials	20		
Design	25		
Wearability	25		
Packaging	10		
<b>TOTAL POINTS</b>	<b>100</b>		
<b>Comments:</b>			





Appendix A: AFNR Career Cluster Content Standards-**Floriculture**

	Performance Measurement Levels	Event Activities Addressing Measurements	Related Academic Standards
ABS.01.01. Performance Indicator: Apply principles of capitalism in the business environment.			Social Studies: 7b and 7g
	ABS.01.01.01.a. Recognize principles of capitalism as related to AFNR businesses.	selling, floral arrangement, corsage, dish garden	
ABS.01.02. Performance Indicator: Apply principles of entrepreneurship in businesses.			Social Studies: 7d
	ABS.01.02.01.b. Classify the characteristics of successful entrepreneurs in AFNR businesses.	selling	
ABS.02.03. Performance Indicator: Apply appropriate management skills to organize a business.			Language Arts: 12; Social Studies: 7f
	ABS.02.03.01.c. Implement management approaches to assure efficiency and profitability.	team activity	
ABS.06.04. Performance Indicator: Develop specific tactics to market AFNR products and services.			Social Studies: 7b, 7g and 7h
	ABS.06.04.01.b. Develop advertising campaigns that promote products and services.	media selling, product display	
ABS.06.05. Performance Indicator: Merchandise products and services to achieve specific marketing goals.			Language Arts: 4; Social Studies: 7b and 7d
	ABS.06.05.01.c. Monitor marketing approaches to determine effectiveness in goal achievement and make needed changes in such approaches.	product display, sales	
ABS.07.01. Performance Indicator: Prepare a step-by-step production plan that identifies needed resources.			Language Arts: 4, 5 and 8
	ABS.07.01.01.c. Adapt production processes based on changing product characteristics.	problem solving	
BS.02.04. Performance Indicator: Safely manage biological materials, chemicals and wastes used in the laboratory.			Science: B2, B3, F4 and F5; Language Arts: 7
	BS.02.04.01.a. Prepare simple chemical solutions using standard operating procedures.	plant disorders/diseases, hazardous situations	

ESS.03.02. Performance Indicator: Apply soil science principles to environmental service systems.		Science: B2 and D2; Social Studies: 3k
	ESS.03.02.02.b. Relate the activities of microorganisms in soil to environmental service systems.	plant disorders/diseases, hazardous situations, general knowledge exam
	ESS.03.02.03.b. Identify the physical qualities of the soil that determine its use for environmental service systems.	potting, asexual propagation, plant disorders/diseases, general knowledge exam
ESS.03.05. Performance Indicator: Apply chemistry principles to environmental service systems.		Science: B2, B3 and F4
	ESS.03.05.01.c. Apply standard operating procedures for use of chemicals in environmental service systems.	plant disorders/diseases, hazardous situations
ESS.04.02. Performance Indicator: Manage safe disposal of all categories of solid waste.		Science: F1, F4 and F5
	ESS.04.02.01.b. Evaluate environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.	hazardous situations, plant disorders/diseases
ESS.04.05. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.		Science: F4 and F5
	ESS.04.05.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	hazardous situations
ESS.06.02. Performance Indicator: Maintain tools, equipment and machinery in safe working order for tasks in environmental service systems.		
	ESS.06.02.01.b. Operate equipment and machinery in accordance with manufacturers' instructions and OSHA standards, specifically addressing personal protective equipment and proper machine guarding.	hazardous situation, team activity, corsage, dish garden, floral arrangements, plant disorders/diseases
NRS.01.01. Performance Indicator: Apply knowledge of natural resource components to the management of natural resource systems.		Math: 5a; Science: C4 and F3; Social Studies: 3h and 3k
	NRS.01.01.01.a. Identify natural resources.	plant ID, general knowledge exam
NRS.01.02. Performance Indicator: Classify natural resources.		Science: F3
	NRS.01.02.01.b. Identify trees and other woody plants.	plant ID
	NRS.01.02.02.b. Identify herbaceous plants.	plant ID

NRS.03.01. Performance Indicator: Produce, harvest, process and use natural resource products.		Science: F3
	NRS.03.01.01.a. Describe forest harvesting methods.	problem solving, general knowledge exam (harvesting of flowers)
PS.01.01. Performance Indicator: Classify agricultural plants according to taxonomy systems.		Science: C3
	PS.01.01.01.c. Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.	plant ID, general knowledge exam, problem solving
	PS.01.01.02.c. Identify agriculturally important plants by scientific names.	plant ID
PS.01.02. Performance Indicator: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.		Science: B6, C3 and C5
	PS.01.02.01.c. Apply the knowledge of cell differentiation and the functions of the major types of cells to plant systems.	general knowledge exam, potting plants, asexual propagation
	PS.01.02.02.c. Relate the active and passive transport of minerals into and through the root system to plant nutrition.	general knowledge exam, problem solving, plant disorders/diseases
	PS.01.02.03.c. Apply concepts associated with translocation to the management of plants.	general knowledge exam
	PS.01.02.04.c. Explain the relationships between leaf structure and functions and plant management practices.	general knowledge exam, problem solving, asexual propagation
	PS.01.02.05.c. Apply the knowledge of flower structures to plant breeding, production and use.	asexual propagation, general knowledge exam, potting plant
	PS.01.02.06.c. Apply the knowledge of seed and fruit structures to plant culture and use.	general knowledge exam, problem solving

PS.01.03. Performance Indicator: Apply knowledge of plant physiology and energy conversion to plant systems.		Science: B6 and C5
	PS.01.03.01.c. Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management.	general knowledge exam, problem solving
	PS.01.03.02.c. Explain the four stages of aerobic respiration and relate cellular respiration to plant growth, crop management and post-harvest handling.	general knowledge exam, asexual propagation
	PS.01.03.03.c. Relate the principles of primary and secondary growth to plant systems.	potting plants, pinching, general knowledge exam
	PS.01.03.04.c. Select plant growth regulators to produce desired responses from plants.	general knowledge exam, problem solving, plant disorders/diseases
PS.02.01. Performance Indicator: Determine the influence of environmental factors on plant growth.		Science: C6
	PS.02.01.01.c. Evaluate plant responses to varied light color, intensity and duration.	general knowledge exam, problem solving
	PS.02.01.02.c. Design, implement and evaluate a plan to maintain optimal conditions for plant growth.	general knowledge exam, problem solving, potting plants
PS.02.02. Performance Indicator: Prepare growing media for use in plant systems.		Science: B2
	PS.02.02.01.b. Describe the physical characteristics of growing media and explain the influence they have on plant growth.	asexual propagation, potting plants, general knowledge exam, plant disorders/diseases
	PS.02.02.02.b. Discuss how soil drainage and water-holding capacity can be improved.	general knowledge exam, plant disorders/diseases
PS.02.03. Performance Indicator: Develop and implement a fertilization plan for specific plants or crops.		Math: 4B; Science: A2
	PS.02.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report.	plant disorders/diseases
	PS.02.03.02.a. Discuss the influence of pH and cation exchange capacity on the availability of nutrients.	plant disorders/diseases, general knowledge exam
	PS.02.03.04.a. Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations and describe different methods of fertilizer application.	plant disorders/diseases, general knowledge exam

PS.03.01. Performance Indicator: Demonstrate plant propagation techniques.		Science: C2
PS.03.01.01.a. Explain pollination, cross-pollination and self-pollination of flowering plants.	general knowledge exam	
PS.03.01.02.a. Demonstrate sowing techniques and provide favorable conditions for seed germination.	general knowledge exam	
PS.03.01.03.c. Evaluate asexual propagation practices based on productivity and efficiency.	asexual propagation, general knowledge exam	
PS.03.02. Performance Indicator: Develop and implement a plant management plan for crop production.		Science: C5 and C6; Language Arts: 7
PS.03.02.01.b. Inspect propagation material for evidence of pests or disease.	plant disorders/diseases	
PS.03.02.02.c. Prepare growing media for planting.	potting, asexual propagation, general knowledge exam	
PS.03.02.05.a. Explain the reasons for controlling plant growth.	general knowledge exam, pinching plants	
PS.03.03. Performance Indicator: Develop and implement a plan for integrated pest management.		Science: C4 and C6; Language Arts: 7
PS.03.03.01.b. Identify major local weeds, insect pests and infectious and noninfectious plant diseases.	plant disorders/diseases, general knowledge exam	
PS.03.03.02.c. Predict pest and disease problems based on environmental conditions and life cycles.	plant disorders/diseases, general knowledge exam	
PS.03.03.03.c. Employ pest management strategies to manage pest populations, assess the effectiveness of the plan and adjust the plan as needed.	plant disorders/diseases, general knowledge exam	
PS.03.03.04.b. Explain procedures for the safe handling, use and storage of pesticides.	hazardous materials, general knowledge exam	
PS.04.01. Performance Indicator: Create designs using plants.		Language Arts: 12
PS.04.01.01.c. Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.	corsage, team activity, dish garden, floral arrangement, growing procedure, general knowledge exam	
PS.04.01.02.c. Create and implement designs by following established principles of art.	floral arrangement, team activity, corsage, dish garden	

CS.01.01. Performance Indicator: Action: Exhibit the skills and competencies needed to achieve a desired result.		Social Studies: 4d and 4h
CS.01.01.01.c. Work independently and in group settings to accomplish a task.	team activity, practicums, general knowledge exam	
CS.01.01.02.c. Assess outcomes to determine success for a task.	corsage, team activity, dish garden, floral arrangement, growing procedure, job interview, sales	
CS.01.01.03.c. Implement an effective project plan.	team activity, dish garden, floral arrangement, corsage	
CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.	all event activities	
CS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.	team activity	
CS.01.02. Performance Indicator: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.		Language Arts: 12; Social Studies: 4h
CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.	team activity, sales, job interview	
CS.01.02.04.c. Evaluate the effectiveness of team members.	team activity	
CS.01.06. Performance Indicator: Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.		Science: A4; Language Arts: 8; Social Studies: 4h
CS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.	problem solving	
CS.02.03. Performance Indicator: Professional Growth: Develop awareness and apply skills necessary for achieving career success.		Language Arts: 12; Social Studies: 4a
CS.02.03.03.c. Demonstrate employability skills for a specific career.	job interview	
CS.02.04. Performance Indicator: Mental Growth: Demonstrate the effective application of reasoning, thinking and coping skills.		Math: 6C; Science: A4; Language Arts: 4, 8
CS.02.04.01.c. Demonstrate critical and creative thinking skills while completing a task.	media selling, problem solving	
CS.02.04.02.c. Implement effective problem solving strategies.	problem solving	
CS.02.04.03.c. Demonstrate the skills needed to negotiate with others.	customer complaint, sales	

CS.03.01. Performance Indicator: Communication: Demonstrate oral, written and verbal skills.		Language Arts: 4, 5 and 12
CS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.	job interview	
CS.03.01.03.c. Make effective business presentations.	sales, media selling, customer complaint	
CS.05.01. Performance Indicator: Manage organizational structures and processes to better serve customers.		Social Studies: 7a
CS.05.01.01.c. Implement a plan to manage relationships with both internal and external customers.	team activity, sales	
CS.06.04. Performance Indicator: Examine health risks associated with a particular skill to better develop personnel safety guidelines.		Science: F1 and F5
CS.06.04.01.c. Implement a plan to mitigate the level of contamination or injury identified in the workplace.	hazardous situation, general knowledge exam	
CS.07.01. Performance Indicator: Apply safety/health practices to AFNR worksites.		Science: F1 and F5
CS.07.01.01.b. Use appropriate personal protective equipment for a given task.	hazardous situation, general knowledge exam	
CS.07.03. Performance Indicator: Follow appropriate procedures in case of an emergency.		
CS.07.03.01.b. Develop various emergency response plan requirements for a facility.	hazardous situation	
CS.07.04. Performance Indicator: Assess workplace safety.		Science: F5
CS.07.04.01.c. Apply general workplace safety precautions/procedures.	hazardous situation, general knowledge exam	
CS.07.04.02.c. Evaluate general workplace safety precautions/procedures for compliance with regulations.	hazardous situation, general knowledge exam	
CS.08.01. Performance Indicator: Evaluate and select the appropriate tool to perform a given task.		
CS.08.01.01.c. Use tools and equipment appropriately to complete a specific task.	floral arrangement, corsage, sales, dish garden	
CS.09.02. Performance Indicator: Apply skills with computer software to accomplish a variety of business activities.		Math: 6C; Science: A3
CS.09.02.01.b. Use basic software systems such as spreadsheet and word processing to complete a task.	job interview, media selling	

## Appendix B: Related Academic Standards- **Floriculture**

National academic standards for mathematics, science, English language arts and social studies related to this event are reported below. The statements are based on information in reports of the respective associations/organizations in the academic areas. Some adjustment of numbering was done to facilitate the process of alignment with the standards that have been developed in the pathways of the Agriculture, Food and Natural Resources (AFNR) Career Cluster.

The approach was to determine the presence of alignment between the content standards, expectations or thematic strands of the four academic areas and the performance indicators of the AFNR Standards. Supporting statements have been included to clarify content of the respective content standards, expectations or thematic strands. The statements were initially developed independently by the respective organizations and, therefore, are not parallel in wording and presentation. Occasionally minor editing was done to adjust the background or stem of a statement but not the statement itself.

### **Mathematics**

#### 4. Standard and Expectations: Measurement

4B. Apply appropriate techniques, tools and formulas to determine measurements.

#### 5. Standard and Expectations: Data Analysis and Probability

5A. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them.

#### 6. Standard and Expectations: Problem Solving

6C. Apply and adapt a variety of appropriate strategies to solve problems.

### **Science**

#### A. Content Standard: Science as an Inquiry

A2. Design and conduct scientific investigations.

A3. Use technology and mathematics to improve investigations and communications.

A4. Formulate and revise scientific explanations and models using logic and evidence.

#### B. Content Standard: Physical Science

B2. Structure and properties of matter.

B3. Chemical reactions.

B6. Interactions of energy and matter.

#### C. Content Standard: Life Science

C2. Molecular basis of heredity.

C3. Biological evolution.

C4. Interdependence of organisms.

C5. Matter, energy and organization in living systems.

C6. Behavior of organisms.

#### D. Content Standard: Earth and Space Science

D2. Geochemical cycles.

#### F. Content Standard: Science in Personal and Social Perspectives

F1. Personal and community health.

F3. Natural resources.

F4. Environmental quality.

F5. Natural and human-induced hazards.

## **English Language Arts**

4. Students adjust their use of spoken, written and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
5. Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
7. Students conduct research on issues and interests by generating ideas and questions and by posing problems. They gather, evaluate and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
8. Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.
12. Students use spoken, written and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion and the exchange of information).

## **Social Studies**

3. Thematic Strand: People, Places and Environments
  - 3h. examine, interpret and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas and ecosystem changes;
  - 3k. propose, compare and evaluate alternative policies for the use of land and other resources in communities, regions, nations and the world.
4. Thematic Strand: Individual Development and Identity
  - 4a. articulate personal connections to time, place and social/cultural systems;
  - 4d. apply concepts, methods and theories about the study of human growth and development, such as physical endowment, learning, motivation, behavior, perception and personality;
  - 4h. work independently and cooperatively within groups and institutions to accomplish goals;
7. Thematic Strand: Production, Distribution, and Consumption
  - 7a. explain how the scarcity of productive resources (human, capital, technological and natural) requires the development of economic systems to make decisions about how goods and services are to be produced and distributed;
  - 7b. analyze the role that supply and demand, prices, incentives and profits play in determining what is produced and distributed in a competitive market system;
  - 7h. apply economic concepts and reasoning when evaluating historical and contemporary social developments and issues;
  - 7d. describe relationships among the various economic institutions that comprise economic systems such as households, business firms, banks, government agencies, labor unions and corporations;
  - 7f. compare how values and beliefs influence economic decisions in different societies;
  - 7g. compare basic economic systems according to how rules and procedures deal with demand, supply, prices, the role of government, banks, labor and labor unions, savings and investments and capital;