# Floriculture

## 8038 36 weeks

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# Course Description

**Suggested Grade Level:** 10 or 11 or 12
**Prerequisites:** 8034

This course prepares students for postsecondary educational career programs and entry-level positions in the floriculture, horticulture, and floral design industries. Instruction includes industry safety in floriculture, the science of floriculture and nursery plant production, plant material identification, floral design basics, marketing, and business management.

*As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.*

# Task Essentials Table

| 8038 | Tasks/Competencies | |
|---|---|---|
| ⊕ | Identify the role of supervised agricultural experiences (SAEs) in agricultural education. | |
| ⊕ | Participate in an SAE. | |
| ⊕ | Identify the benefits and responsibilities of FFA membership. | |
| ⊕ | Describe leadership characteristics and opportunities as they relate to agriculture and FFA. | |
| ○ | Apply for an FFA degree and/or an agricultural proficiency award. | |
| ⊕ | Follow safety procedures in the floriculture industry. | |
| ⊕ | Evaluate greenhouse facilities and operations. | |

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|---|---|---|
| ⊕ | Compare types of floral businesses. | |
| ⊕ | Identify floriculture plants. | |
| ○ | Create a floriculture plant collection. | |
| ⊕ | Propagate plants. | |
| ⊕ | Explain how temperature affects plant growth. | |
| ⊕ | Explain the importance of light in plant production. | |
| ⊕ | Evaluate the importance of water and water-delivery systems. | |
| ⊕ | Manipulate plant nutrient requirements to guard against nutritional deficiencies. | |
| ⊕ | Assess substrates for container-grown or field-grown plants. | |
| ⊕ | Control plant growth. | |
| ⊕ | Explain how to manage pests. | |
| ○ | Harvest cut flowers. | |
| ⊕ | Prepare plants for marketing. | |
| ⊕ | Produce floriculture crops. | |
| ⊕ | Evaluate business markets. | |
| ⊕ | Maintain business records. | |
| ⊕ | Develop a business plan. | |
| ⊕ | Price merchandise and floral design work. | |
| ⊕ | Analyze government regulations and influences on the floriculture business. | |
| ⊕ | Explain how one can earn a pesticide certification in Virginia. | |
| ⊕ | Demonstrate care and handling of fresh flowers and foliage. | |
| ⊕ | Analyze the principles and elements of design. | |
| ⊕ | Demonstrate basic floral skills. | |
| ⊕ | Design vase arrangements. | |
| ○ | Design one-sided, geometric-shaped arrangements. | |
| ⊕ | Design centerpieces. | |

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|---|---|---|
| ○ | Design holiday arrangements. | |
| ⊕ | Design wearable flowers. | |
| ⊕ | Design bouquets. | |
| ○ | Create floral arrangements with preserved and/or artificial floral materials. | |

Legend: ⊕Essential ○Non-essential ⊖Omitted

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**Note: Competencies 39-43 have been added to ensure compliance with federal legislation: National FFA Organization's Federal Charter Amendments Act (Public Law 116-7, https://www.congress.gov/116/plaws/publ7/PLAW-116publ7.pdf). All inquiries may be sent to cte@doe.virginia.gov. Students are provided opportunities for leadership, personal growth, and career success. Instruction is delivered through three major components: classroom and laboratory instruction, supervised agricultural experience (SAE) program, and student leadership (FFA).**

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# Curriculum Framework

## Task Number 39

## Identify the role of supervised agricultural experiences (SAEs) in agricultural education.

### Definition

Identification should include

- defining an SAE program as *an opportunity for students to consider multiple careers and occupations in the agriculture, food, and natural resources (AFNR) industries, learn expected workplace behavior, develop specific skills within an industry, and apply academic and occupational skills in the workplace or a simulated workplace environment*
- researching the Foundational SAE
    - career exploration and planning
    - personal financial planning and management
    - workplace safety
    - employability skills for college and career readiness
    - agricultural literacy
- researching the Immersion SAE
    - entrepreneurship/ownership
    - placement/internships
    - research (experimental, analytical, invention)
    - school business enterprises

    - service learning
- developing a plan to participate in an SAE, based on personal and career goals
- researching available awards and degrees, based on SAE participation.

Teacher resource: SAE Resources, National Council for Agricultural Education

### Process/Skill Questions

- What are examples of SAEs related to this course and in the AFNR industries?
- Where can a copy of the Virginia SAE Record Book be found?
- What is an Immersion SAE?
- How does a placement/internship SAE differ from an ownership/entrepreneurship SAE?
- How does an SAE provide relevant work experience and contribute to the development of critical thinking skills?
- How is the SAE an extended individualized instructional component of a student's Career Plan of Study?
- How can an SAE be used to provide evidence of student growth and participation in authentic, work-related tasks?
- What are the four types of SAEs?
- What are the advantages of participating in work-based learning experiences and projects?
- How does one choose an appropriate SAE in which to participate?

# Task Number 40

# Participate in an SAE.

### Definition

Participation should include

- developing, completing, or continuing a plan to participate in an SAE as a work-based learning experience, based on personal and career goals
- documenting experience, connections, positions held, and competencies attained, using the *Virginia SAE Record Book*
- researching available awards and degrees, based on SAE participation.

Teacher resources:
FFA SAE
The Agricultural Experience Tracker

### Process/Skill Questions

- What are the advantages of participating in work-based learning experiences and projects?
- How do SAEs help prepare students for the workforce?
- What are some examples of SAEs in AFNR?

# Exploring Leadership Opportunities through FFA

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## Task Number 41

## Identify the benefits and responsibilities of FFA membership.

### Definition

Identification should include

- benefits
    - listing opportunities to participate in community improvement projects and career development events (CDEs) and leadership development events (LDEs)
    - exploring leadership development opportunities

- responsibilities
    - researching the responsibilities of FFA officers, committees, and members
    - locating resources that guide participation in FFA activities
    - explaining the FFA Creed, Motto, Salute, and mission statement
    - explaining the meaning of the FFA emblem, colors, and symbols
    - explaining significant events and the history of the organization.

### Process/Skill Questions

- How does one become an FFA member?
- What is the FFA's mission and how does it accomplish its mission?
- What are the benefits and responsibilities of FFA membership?
- What five FFA activities are available through the local chapter?
- What are some significant events in FFA history? How have these events shaped membership over time?
- What is the FFA program of activities (POA), and how is it used?

## Task Number 42

## Describe leadership characteristics and opportunities as they relate to agriculture and FFA.

### Definition

Description should include

- examples of successful leaders
- types of leadership

    - autocratic
    - participative
    - laissez-faire
    - servant
    - followership
- positive leadership qualities and traits of successful leaders
- opportunities for participating in leadership activities in FFA
- demonstrating methods for conducting an effective meeting.

### Process/Skill Questions

- Who are some successful leaders in the agriculture industry?
- What qualities make a successful leader?
- What are leadership traits?
- What is the difference between positive and negative leadership?

# Task Number 43

# Apply for an FFA degree and/or an agricultural proficiency award.

### Definition

Application should include

- identifying types of FFA degrees
    - Greenhand
    - Chapter
    - State
    - American
- identifying proficiency award areas
    - entrepreneruship
    - placement
    - combined
    - agriscience research
- exploring CDEs and LDEs related to this course
- identifying all SAE criteria to be eligible for the award
- identifying the type of award
- applying for an FFA award.

Teacher resource: FFA Agricultural Proficiency Awards

### Process/Skill Questions

- Where are the awards and their application criteria located?
- What are the benefits of winning an FFA award?
- What are the benefits and requirements of an FFA degree?
- What FFA awards are available?

- How does the FFA degree program reward FFA members in all phases of leadership, skills, and occupational development?
- What is the highest degree that can be conferred upon an FFA member at the national level?
- What are the requirements for a Greenhand FFA degree?

# Gaining an Overview of the Floriculture Industry

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## Task Number 44

## Follow safety procedures in the floriculture industry.

### Definition

Following safety procedures should include

- identifying safety hazards
  - physical
  - chemical
  - biological
  - ergonomic
  - weather
  - general safety
- passing all required safety tests for machinery, tools, and equipment with 100 percent
- following all requirements related to personal protective equipment (PPE)
- demonstrating industry-recommended safety procedures when using chemicals, tools, machinery, equipment, and other supplies in the classroom, laboratory, greenhouse, and/or land lab
- adhering to laws and regulations concerning safety in the floriculture industry
- complying with the Agricultural Worker Protection Standard (WPS).

Teacher resources: Centers for Disease Control and Prevention (CDC), National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Department of Labor (DOL)

### Process/Skill Questions

- What clothing and equipment are required for personal safety in the floriculture industry?
- How do clothing and equipment help keep workers in the floriculture industry safe?
- What are the laws that address safety procedures in the floriculture industry?

## Task Number 45

## Evaluate greenhouse facilities and operations.

## Definition

Evaluation should include

- designing greenhouse layout, considering
    - structure orientation
    - topography
    - accessibility
    - availability of water and other utilities
    - municipal laws, zoning laws, and other restrictions (e.g., Americans with Disabilities Act [ADA])
- comparing greenhouse styles, including
    - Quonset
    - gutter-connected
    - retractable-roof
- contrasting glazing materials, including
    - glass
    - polyethylene
    - acrylic
    - polycarbonate
- designing bench and bed arrangements, including
    - bench materials
    - roll-out beds
    - floor production
    - investigating growing containers
- researching greenhouse cooling options, including
    - shade cloth and shading compounds
    - fan-tube systems
    - pad and fan systems
- exploring greenhouse heating and energy sources, including
    - passive solar
    - unit
    - central.

## Process/Skill Questions

- Why are floral crops often grown in greenhouses?
- What factors should one consider when choosing the location and layout of a greenhouse?
- What are the advantages and disadvantages of the different glazing materials used for greenhouses?
- How are greenhouses heated?
- How are greenhouses cooled?
- What are some potential safety hazards associated with employees working in the greenhouse?
- What are the advantages/disadvantages of the various benching systems?
- What is the difference between a hoop house and a greenhouse?
- How do hoop houses extend the growing season for flower farmers?
- What are the major costs associated with operating a greenhouse?
- How does location affect the greenhouse?
- What ADA considerations should be made in greenhouse design?

# Task Number 46

# Compare types of floral businesses.

### Definition

Comparison should include evaluating and comparing types of floral businesses, such as

- full-service shop
- large-volume shop
- satellite shop
- party florist
- carriage trade shop
- bucket shop
- online business
- farmer's market
- farmer florist
- garden center
- grocery store
- cut flower operation.

### Process/Skill Questions

- What are the differences among the various types of floral businesses?
- What are important aspects of location to research before choosing a shop site?
- How does an online business operate?
- How does a farmer florist differ from a full-service or retail shop?

# Identifying Plant Materials

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# Task Number 47

# Identify floriculture plants.

### Definition

Identification should include

- categorizing plants according to use (e.g., cut flower, cut foliage, potted plant, foliage plant, bedding plant)
- assessing characteristics of floriculture plants
- identifying plants from live samples, photos, slides, and databases

- identifying plants based on their growing season in Virginia (e.g., peonies in May, ranunculus in April, sunflowers in the fall).

### Process/Skill Questions

- How are plants categorized according to their use?
- What are five categories of floriculture plants?
- What are the identifying characteristics of floriculture plants?
- How do growing seasons affect plant availability for farmer florists in Virginia?
- How are plants commercially important?

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## Task Number 48

## Create a floriculture plant collection.

### Definition

Creation should include

- representative samples of the various categories (e.g., cut flower, cut foliage, potted plant, foliage plant, bedding plant)
- a collection of samples (e.g., live, dried, and/or artificial specimens).

### Process/Skill Questions

- What are representative samples of the five categories of floriculture plants?
- What are the identifying characteristics of floriculture plants?

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# Applying Science to Plant Production

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## Task Number 49

## Propagate plants.

### Definition

Propagation should include

- sexual reproduction of plants
- seed harvesting and storage
- pretreatments (e.g., stratification, scarification, pelleted, coated)
- identification of substrate, light, temperature, nutrient and water requirements
- identification of disease problems
- asexual reproduction of plants (e.g., stem, leaf, root)
- plants from runners
- consideration of micropropagation.

### Process/Skill Questions

- What are the differences between sexual and asexual plant propagation?
- How are new varieties and cultivars developed through hybridization?
- What are the cultural requirements for seed germination?
- How is seed safely stored?
- How do seed pretreatments affect seed germination?
- What are the desired characteristics of propagation substrates?
- How does temperature affect propagation?
- What are the water requirements of a propagation area? How can water be regulated?
- How do plant diseases affect the economics of plant propagation?
- How do growers determine whether to purchase plugs and/or cuttings or to produce their own seedlings and rooted cuttings?
- Under what circumstances is micropropagation economically and culturally advantageous?
- What are the costs associated with different methods of propagation?
- How does the location and time of year affect the method of propagation one should use?
- How are seeds stratified?

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# Task Number 50

# Explain how temperature affects plant growth.

### Definition

Explanation should include

- air temperature ranges
- average daily temperature
- temperature recommendations
- substrate temperature for bulbs, seeds, and cuttings.

### Process/Skill Questions

- What is the importance of establishing optimum and tolerable temperature ranges?
- How is the average daily temperature calculated?
- What is the importance of calculating the average daily temperature?

# Task Number 51

# Explain the importance of light in plant production.

## Definition

Explanation should include

- selecting species for different light regimes
- color, intensity, and duration of light
- daily light integral (DLI) measurements
- light saturation
- light compensation
- acclimatizing plants
- photoperiodism
- time clock devices for night interruptions
- lighting and day extension
- black cloth for night extension
- types of artificial lighting systems.

## Process/Skill Questions

- How can color, intensity, and duration of light influence the quality of plant growth?
- What are some applications of artificial lighting systems?
- How are plants acclimatized?
- What precautions should be taken to avoid light saturation?
- How can light energy be maximized?
- How is the appropriate type of artificial light determined?
- How can a light meter be used to help make informed decisions about lighting?

# Task Number 52

# Evaluate the importance of water and water-delivery systems.

## Definition

Evaluation should include

- permanent wilting point
- water quality, including electrical conductivity, pH, and nutrient content
- sources of water
- types of water treatments
- types of pumps and power used in water delivery systems
- types of irrigation systems for greenhouse and nursery production, including
    - hand watering
    - drip irrigation using microtubes
    - in-line drippers

    - perimeter nozzles
    - flood and trough
    - capillary mat
    - overhead
- automatic irrigation devices in irrigation systems.

### Process/Skill Questions

- What is *permanent wilting point*?
- How does water quality affect plant growth?
- What sources of water may be available to growers?
- What types of water treatment systems can be used to correct water quality?
- What are the major attributes of each of the water delivery systems?
- What are the limitations of automatic watering?
- What are the major components of a watering system?
- What are the major costs associated with a watering system?

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# Task Number 53

# Manipulate plant nutrient requirements to guard against nutritional deficiencies.

### Definition

Manipulation should include

- identifying micronutrients for selected crops
- identifying macronutrients for selected crops
- identifying essential nutritional elements
- identifying soil and growing substrates
- interpreting soil test results
- applying organic and inorganic fertilizers
- identifying sources of nutrients
- identifying the level of soluble salts in the soil
- identifying deficiency and toxicity symptoms of the major nutrient
- explaining fertilizer recommendations
- recommending methods of fertilizer application, including
    - pre-plant fertilization with controlled-release fertilizers
    - fertigation
    - surface application of water-soluble fertilizers
    - subsurface injection of foliage application.

### Process/Skill Questions

- Which major elements are necessary for healthy green plant growth?
- What information can be obtained from a soil test?

- What are the differences between granular and water-soluble fertilizers?
- Which organic fertilizers can be used in floriculture crop production?
- Why is it important for a grower to develop a fertilizer schedule?
- How is the fertilizer analysis interpreted?
- What are the advantages of using pre-plant fertilizers?
- How do controlled-release fertilizers work?
- What are the differences between micronutrients and macronutrients?

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# Task Number 54

# Assess substrates for container-grown or field-grown plants.

### Definition

Assessment should include

- individual substrate components
- combinations of substrate components
- evaluation of specific plant requirements for soil structure, moisture holding ability, drainage ability, and fertility
- analysis of possible soil amendments
- chemical supplements for the soil
- sterilization of field soils and substrates, using heat treatments, fumigation, and/or chemicals.

### Process/Skill Questions

- What are the advantages of using commercially prepared amendments?
- How do various amendments affect substrate pH?
- Why are some substrates better suited to certain crops than to others?
- What is the importance of using sterilized substrates?
- What are the advantages and disadvantages of using planting media mixes?
- What materials are used in soilless plant media mixes, and why are they used?
- What are the differences between organic and inorganic fertilizers?
- How does pH affect plant growth and development?

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# Task Number 55

# Control plant growth.

### Definition

Control could include using

- natural plant growth regulators, including auxins, gibberellins, cytokinins, and ethylene
- chemical growth regulators, including B-Nine, Cycocel, A-Rest, Bonzi, and Florel (ethephon)
- non-chemical means (e.g., cultivar selection, light management, cultural procedures, container size, nutrient restriction, water stress)
- environmental factors that affect growth control (e.g., temperature, light, pH, moisture)
- spacing of plants
- pinching of plants
- disbudding of flowering plants.

### Process/Skill Questions

- What are the identified functions of plant growth hormones?
- How can plant growth be restricted through cultural measures?
- What is the importance of adequate spacing of plants in growing beds or benches?

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# Task Number 56

# Explain how to manage pests.

### Definition

Explanation should include

- Integrated Pest Management (IPM)
- types of pest management (e.g., mechanical, cultural, chemical, organic/alternative, biological)
- pesticide mode of action
- use of pesticide safety information, including
    - centralized bulletin board
    - personal pesticide safety training
    - EPA-approved warning signs
    - personal protective equipment (PPE)
    - safety data sheets (SDS)
    - chemical storage, disposal, and mixing areas
    - pesticide labels
- use and calibration of pesticide application equipment, including hand-pump sprayer, backpack sprayer, gas or electric sprayer, foggers, and granule dispensers
- timing of pesticide application
- pesticide formulations, including wettable powders, emulsifiable concentrates, dusts, aerosols, fogs, smokes, and granules
- pesticide compatibility
- disposal methods
- pest resistance to chemicals
- phytotoxicity
- identification of arthropod pests, including aphids, fungus gnats, mealybugs, mites, scale insects, thrips, and whiteflies

- identification of plant diseases, including viruses, bacteria, and fungi (e.g., botrytis, damping-off, root rot)
- identification of weeds and the economic damage caused by them
- how to use chemicals to manage pests, including
    - mixing liquid pesticides
    - applying pesticides, using a backpack sprayer
- how granular pesticides are applied.

### Process/Skill Questions

- What are the key components of IPM?
- How can a grower determine whether a contact or a systemic protectant should be applied?
- What are the environmental hazards associated with irresponsible pesticide use?
- What safety precautions must be observed when handling pesticides?
- What information is printed on every pesticide label?
- What is pesticide compatibility, and how is it assessed?
- When is the application of a chemical pesticide justified?
- What biological pest management methods are currently available?

# Task Number 57

# Harvest cut flowers.

### Definition

Harvesting should include

- cutting and grading flowers
- bunching and wrapping flowers
- pulsing and flower foods.

### Process/Skill Questions

- How are commercially grown flowers and foliage harvested?
- What are the standards by which floral crops are graded?
- What techniques can be used to extend the life of commercial cut flowers?
- What are the major types of flowers that are often grown in the cut-your-own businesses?
- What changes are the new cut/harvest-your-own agritourist businesses having on the flower industry and prices?

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# Task Number 58

# Prepare plants for marketing.

### Definition

Preparation could include

- developing a written plan to address how to prepare plants for marketing
- packing plants, cut flowers, or foliage for shipment according to industry standards
    - sleeving and boxing
    - loading potted plants into a vehicle
    - comparing various shipping methods and shipping costs (e.g., truck, common carrier, air freight)
- dressing pots.

### Process/Skill Questions

- How are commercially grown flowers, foliage, and other plants packed for shipment?
- What are the standards by which plants are packed for shipment? What role does science play in determining these standards?
- What are the common ways to dress pots?

# Task Number 59

# Produce floriculture crops.

### Definition

Production could include the following:

- Research and develop, using current technology, a greenhouse container crop production schedule, including
    - producing a fall crop (e.g., cyclamen, Zygocactus, primula, azalea, or poinsettia)
    - forcing bulbs for winter sales.
- Produce bedding plants, including
    - sexual propagation
    - transplanting seedlings and/or plugs
    - labeling plants
    - managing water, nutrition, and pests.
- Produce foliage plants, including
    - propagating foliage from cuttings
    - transplanting rooted cuttings
    - selecting and purchasing rooted cuttings
    - labeling and managing plant growth.
- Produce cut flowers, including
    - establishing cut-flower crop from seeds, cuttings, or purchased liners
    - managing crop through harvest.

### Process/Skill Questions

- What must be researched in order to develop a complete crop production schedule?
- What are examples of markets for bedding plants? Foliage plants? Cut flowers?
- What are some growing niche markets in the floriculture sector?
- What are the laws or regulations relative to selling plants and seeds?

- What role does the Virginia Department of Agriculture and Consumer Services (VDACS) play in the selling of floriculture crops?

# Understanding Marketing and Business Management

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## Task Number 60

## Evaluate business markets.

### Definition

Evaluation should include

- comparing wholesale markets with retail markets, including
    - garden centers
    - farmers markets
    - roadside stands
    - on-farm sales
    - landscape contractor sales
    - mass markets
    - florists
- exploring mail-order merchandising
- investigating re-wholesale markets
- developing advertising strategies, including
    - writing a news release
    - designing a printed advertisement
    - investigating web-based advertising
    - locating markets.

### Process/Skill Questions

- What are the differences between retail and wholesale markets?
- What is re-wholesale?
- What information may be included in a news release?
- Why is it important to diversify advertising strategies?

## Task Number 61

## Maintain business records.

### Definition

Maintenance should include

- keeping inventory, using current technology as available
- keeping production records
- recording pest management practices
- checking received merchandise against invoices
- writing sales tickets and receiving payments
- keeping sales records.

### Process/Skill Questions

- What types of records must every business keep?
- What industry-specific records must be maintained in floral production businesses?

# Task Number 62

# Develop a business plan.

### Definition

Development should include

- investigating the advantages and disadvantages of sole proprietorships, partnerships, and corporations
- developing and analyzing a market survey
- investigating sources of capital
- analyzing an organizational plan
- researching laws and regulations
- researching methods for advertising
- creating financial records, to include a balance sheet, cash flow statement, profit and loss statement, and inventory report
- identifying the break-even point and determining the profit margin
- demonstrating appropriate forms of business communication, to include business letters, phone calls, and emails.

### Process/Skill Questions

- What is a business plan?
- Why is a business plan important?
- Should business goals be flexible? Why or why not?
- What volume must be sold in order to make a profit?
- What are five basic functions performed in the operation of a small business?

# Task Number 63

# Price merchandise and floral design work.

### Definition

Pricing should include

- a cost analysis of floral arrangements
- calculation of the cost of greenhouse crop merchandise
- the ratio mark-up method of pricing
- the percentage mark-up method of pricing
- other methods of pricing merchandise and services.

### Process/Skill Questions

- What is a unit cost of goods?
- What expenses are incorporated into overhead?
- How are retail prices determined, using the ratio mark-up method?
- What other method or methods may be used to price merchandise?
- How can services be priced?
- How is tax calculated?

# Task Number 64

# Analyze government regulations and influences on the floriculture business.

### Definition

Analysis should include

- identifying safety regulations
- identifying personnel regulations
- recognizing environmental code standards
- explaining patents and trademarks.

### Process/Skill Questions

- What are some government regulations that may affect how a grower conducts business?
- What business licenses are required before opening a retail florist shop?
- What labor concerns might a plant production business encounter?
- How do EPA regulations affect plant production facilities?
- Why are government regulations important?
- What are considerations for selling across state lines?

# Task Number 65

# Explain how one can earn a pesticide certification in Virginia.

### Definition

Explanation should include

- federal and state laws governing pesticide certification
- types of pesticide licenses
- supervision requirements
- testing requirements
- age requirements
- time requirements
- recertification requirements.

Teacher resources: National Pesticide Applicator Certification Core Manual, National Association of State Departments of Agriculture (NASDA), and Virginia Tech Pesticide Programs

### Process/Skill Questions

- What are the laws associated with licensing?
- What specific areas require particular pesticide licenses?
- What type of pesticide license might one qualify for in high school?

# Gaining an Overview of Floral Design

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## Task Number 66

## Demonstrate care and handling of fresh flowers and foliage.

### Definition

Demonstration could include

- checking water temperature for conditioning
- using preservative water mixtures
- conditioning flowers and foliage
- adhering to commercial standards of packing and storing
- determining causes of deterioration and death of flowers
- regulating temperature of refrigeration units.

### Process/Skill Questions

- How do floral preservatives sustain freshness?
- What is the difference between floral conditioning and storage?
- What factors influence floral keeping quality?
- What are possible causes of deterioration or death of cut flowers?
- What considerations should be made for shipping and delivery of floral products?

## Task Number 67

# Analyze the principles and elements of design.

## Definition

Analysis should include

- principles of design
- proportion in design
- rhythm applied to floral design
- balance in design
- line and form in floral design
- shapes of floral materials (e.g., line, form, mass, filler)
- combinations and schemes using the color wheel
- qualities of color
- tint and shade.

## Process/Skill Questions

- Why are the principles of design important to floral design?
- How can an arrangement be checked for balance, proportion, and rhythm?
- How is line significant in floral arrangements?
- How can floral materials be categorized by shape?
- How are form and shape different?
- What are the emotional characteristics of the colors found on a color wheel?
- What is the difference between tint and shade?

# Task Number 68

# Demonstrate basic floral skills.

## Definition

Demonstration should include

- floral design tools identification
- floral design supplies identification
- ribbon identification by size, material, and typical use
- flower wiring, using various methods
- flower taping
- floral foam cutting, soaking, and attachment
- pin-frog/needlepoint holder attachment
- water tube usage
- bow construction.

## Process/Skill Questions

- What is the basic inventory of necessary supplies used in floral design?
- Why do flowers need to be wired?

- What are three different methods for wiring a flower?
- Why is floral tape used?
- Why are bows used with potted plants?
- How should floral foam be prepared for designing?
- What types of bows and sizes of bows are appropriate for different designs?

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# Designing with Flowers

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## Task Number 69

## Design vase arrangements.

### Definition

Design should include at least two of the following:

- Bud-vase arrangement
- Mixed-flower, one-sided vase arrangement
- Mixed-flower, all-around vase arrangement
- Roses in a vase

### Process/Skill Questions

- Why are vase arrangements popular cash-and-carry items?
- How do bud-vase arrangements differ from other arrangements?
- What is the difference between one-sided and all-around arrangements?
- Why are roses sold in a vase?

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## Task Number 70

## Design one-sided, geometric-shaped arrangements.

### Definition

Design should include

- symmetrical triangle
- asymmetrical triangle

- vertical design
- scalene triangle
- circular design
- crescent.

### Process/Skill Questions

- In what circumstances are one-sided arrangements best used?
- Where might a vertical arrangement be placed?
- What flowers are best used for creating a crescent arrangement?
- How can symmetrical and asymmetrical arrangements be differentiated?
- How can arrangements be compared to geometric shapes?

# Task Number 71

# Design centerpieces.

### Definition

Design should include at least two of the following:

- Round
- Oval
- Conical
- Adding candles to centerpieces
- Incorporating selected accessories into centerpieces
- Seasonal/holiday

### Process/Skill Questions

- How is size determined when planning a centerpiece?
- How are shape and types of flowers and greenery selected for centerpieces?
- What are the differences between creating a round centerpiece and creating an oval centerpiece?
- What accessories could be added to a centerpiece?
- How can centerpieces enhance holidays?

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# Task Number 72

# Design holiday arrangements.

### Definition

Design should include

- local greenery suitable for design

- wreaths on straw or foam forms
- wreaths on wire forms
- door swag
- roping/garland
- cones, fruit, and accessories
- wreath bow.

### Process/Skill Questions

- What are the advantages and disadvantages of straw, foam, and wire wreath forms?
- How is local greenery conditioned to make it suitable for design?
- What are the advantages and disadvantages of preparing custom vs. stock holiday arrangements?
- Why are accessories added to holiday arrangements?

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# Task Number 73

# Design wearable flowers.

### Definition

Design should include at least two of the following:

- Corsages
- Boutonnieres
- A floral hairpiece
- A wrist corsage.

### Process/Skill Questions

- Why is wire used to replace the flower's stem when designing floral adornment?
- What is the purpose of stem wrapping tape?
- What are the differences between a corsage and a boutonniere?
- Where on the body are flowers worn for formal occasions?
- When should floral glue be used to replace wiring and taping?

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# Task Number 74

# Design bouquets.

### Definition

Design should include at least two of the following:

- Small nosegay construction
- Bridal bouquet, using a foam holder
- Flower-petal basket
- Hand-tied bouquet
- New techniques in bouquet construction.

### Process/Skill Questions

- What are advantages and disadvantages of a stem bouquet design as compared to a foam-holder bouquet design?
- How are bouquets and nosegays sized?
- Where are bouquets used?
- What flowers are used in making bouquets?

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## Task Number 75

## Create floral arrangements with preserved and/or artificial floral materials.

### Definition

Creation should include

- air-dried flowers
- flowers dried with a drying agent
- flowers treated with glycerin
- floral arrangements using artificial and/or dried materials.

### Process/Skill Questions

- What are the steps involved in air-drying flowers and foliage?
- How can foliage be successfully preserved using glycerin?
- What special precautions are necessary when designing with dried floral materials?
- What are the advantages of designing with artificial materials?

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# SOL Correlation by Task

| | | |
|---|---|---|
| 39 | Identify the role of supervised agricultural experiences (SAEs) in agricultural education. | English: 10.3, 10.5, 11.3, 11.5, 12.3, 12.5 |
| 40 | Participate in an SAE. | English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8 |
| 41 | Identify the benefits and responsibilities of FFA membership. | English: 10.5, 10.6, 10.7, 10.8, 11.5, 11.6, 11.7, 11.8, 12.5, 12.6, 12.7, 12.8 |

| | | |
|---|---|---|
| 42 | Describe leadership characteristics and opportunities as they relate to agriculture and FFA. | English: 10.5, 11.5, 12.5<br><br>History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHII.8, WHII.10, WHII.11 |
| 43 | Apply for an FFA degree and/or an agricultural proficiency award. | English: 10.5, 11.5, 12.5 |
| 44 | Follow safety procedures in the floriculture industry. | English: 10.5, 11.5, 12.5 |
| 45 | Evaluate greenhouse facilities and operations. | English: 10.5, 10.8, 11.5, 11.8, 12.5, 12.8 |
| 46 | Compare types of floral businesses. | English: 10.5, 11.5, 12.5 |
| 47 | Identify floriculture plants. | |
| 48 | Create a floriculture plant collection. | |
| 49 | Propagate plants. | |
| 50 | Explain how temperature affects plant growth. | English: 10.5, 11.5, 12.5<br><br>History and Social Science: WG.2, WG.3<br><br>Science: BIO.4, BIO.8 |
| 51 | Explain the importance of light in plant production. | English: 10.5, 11.5, 12.5<br><br>Science: BIO.8 |
| 52 | Evaluate the importance of water and water-delivery systems. | |
| 53 | Manipulate plant nutrient requirements to guard against nutritional deficiencies. | |
| 54 | Assess substrates for container-grown or field-grown plants. | |
| 55 | Control plant growth. | |
| 56 | Explain how to manage pests. | English: 10.5, 11.5, 12.5<br><br>History and Social Science: VUS.13, VUS.14 |
| 57 | Harvest cut flowers. | |
| 58 | Prepare plants for marketing. | English: 10.6, 10.7, 11.6, 11.7, 12.6, 12.7 |
| 59 | Produce floriculture crops. | English: 10.2, 10.8, 11.2, 11.8, 12.2, 12.8 |
| 60 | Evaluate business markets. | English: 11.2, 11.5, 11.6, 11.7, 11.8, 12.2, 12.5, 12.6, 12.7, 12.8 |
| 61 | Maintain business records. | English: 10.6, 11.6, 12.6 |
| 62 | Develop a business plan. | English: 10.1, 10.5, 10.6, 10.7, 10.8, 11.1, 11.5, 11.6, 11.7, 11.8, 12.1, 12.5, 12.6, 12.7, 12.8<br><br>History and Social Science: GOVT.1<br><br>Mathematics: PS.8*, PS.9* |
| 63 | Price merchandise and floral design work. | Mathematics: A.1, A.2 |
| 64 | Analyze government regulations and influences on the floriculture business. | English: 10.5, 11.5, 12.5<br><br>History and Social Science: GOVT.9, GOVT.15 |
| 65 | Explain how one can earn a pesticide certification in Virginia. | English: 10.5, 11.5, 12.5 |

| | | |
|---|---|---|
| 66 | Demonstrate care and handling of fresh flowers and foliage. | English: 10.5, 11.5, 12.5 |
| 67 | Analyze the principles and elements of design. | English: 10.5, 11.5, 12.5 |
| 68 | Demonstrate basic floral skills. | |
| 69 | Design vase arrangements. | |
| 70 | Design one-sided, geometric-shaped arrangements. | Mathematics: G.3 |
| 71 | Design centerpieces. | |
| 72 | Design holiday arrangements. | |
| 73 | Design wearable flowers. | |
| 74 | Design bouquets. | |
| 75 | Create floral arrangements with preserved and/or artificial floral materials. | |

# FFA Information

The National FFA is an organization dedicated to preparing members for leadership and careers in the science, business, and technology of agriculture. Local, state, and national activities and award programs provide opportunities to apply knowledge and skills acquired through agriculture education.

For additional information about the student organization, see the National FFA website and the Virginia FFA Association website.

# Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked "optional."

# Appendix: Credentials, Course Sequences, and Career Cluster Information

**Industry Credentials: Only apply to 36-week courses**

- BASF Plant Science Certification Examination
- College and Work Readiness Assessment (CWRA+)
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- Floriculture Assessment
- Floriculture: Greenhouse Assessment
- Greenhouse Operators Certification Examination
- Horticulture-Landscaping Assessment
- National Career Readiness Certificate Assessment
- Principles of Floral Design Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

**Concentration sequences:** *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Agricultural Business Fundamentals I (8022/36 weeks)
- Agricultural Business Management III (8026/36 weeks)
- Agricultural Business Operations II (8024/36 weeks)
- Applied Agricultural Concepts (8073/36 weeks)
- Biological Applications in Agriculture (8086/36 weeks)
- Floral Design I (8055/36 weeks)
- Floral Design II (8056/36 weeks)
- Greenhouse Plant Production and Management (8035/36 weeks)
- Horticulture Sciences (8034/36 weeks)
- Introduction to Plant Systems (8007/36 weeks)
- Landscaping I (8036/36 weeks)
- Landscaping II (8039/36 weeks)

| **Career Cluster: Agriculture, Food and Natural Resources** | |
|---|---|
| **Pathway** | **Occupations** |
| **Agribusiness Systems** | **Agricultural Commodity Broker**<br>**Agricultural Economist**<br>**Agricultural Loan Officer**<br>**Agricultural Products Sales Representative**<br>**Farm Products Purchasing Agent and Buyer**<br>**Farm, Ranch Manager**<br>**Farmer/Rancher**<br>**Feed, Farm Supply Store Sales Manager**<br>**Sales Manager** |
| **Plant Systems** | **Agricultural Products Sales Representative**<br>**Botanist**<br>**Certified Crop Advisor**<br>**Crop Grower** |

| Career Cluster: Agriculture, Food and Natural Resources | |
|---|---|
| **Pathway** | **Occupations** |
| | **Custom Harvester**<br>**Farm, Ranch Manager**<br>**Farmer/Rancher**<br>**Floral Designer**<br>**Floral Shop Manager**<br>**Forest Geneticist**<br>**Golf Course Superintendent**<br>**Machine Setter, Operator**<br>**Nursery and Greenhouse Manager**<br>**Ornamental Horticulturist**<br>**Plant Breeder/ Geneticist**<br>**Secondary School Teacher**<br>**Soil and Plant Scientist**<br>**Tree Surgeon**<br>**Turf Farmer** |

| Career Cluster: Science, Technology, Engineering and Mathematics | |
|---|---|
| **Pathway** | **Occupations** |
| **Science and Mathematics** | **Biologist**<br>**Botanist**<br>**Chemist**<br>**Microbiologists**<br>**Plant Biologist**<br>**Plant Breeder and Geneticist**<br>**Plant Pathologist**<br>**Research Chemist**<br>**Secondary School Teacher**<br>**Technical Writer**<br>**Toxicologist** |