Horticultural Science

Topics in Horticultural Science include career opportunities, safety, plant physiology, growing media, greenhouse facilities, greenhouse and nursery crop production, plant identification and classification, pest management, hydroponics and vegetable gardening, and technological applications.

Content standards for this course are not intended to serve as the entire curriculum. Teachers are encouraged to expand the curriculum beyond the limits of these content standards to accommodate specific community interests and utilize local resources. This course encourages critical thinking, use of the scientific method, integration of technology, development of student leadership skills, and application of knowledge and skills related to practical questions and problems. Safety concepts are integrated into instruction to the maximum extent possible.

This course may be taught as a one-credit or half-credit course. For a half-credit course, content standards 1, 2, 3, 4, 5, 6, 7, 9, 13, 14, and 16 must be included.

Career and technical student organizations are integral, cocurricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Career Opportunities

Students will:

1. Explain the importance of horticulture to local, state, national, and world economies.
2. Identify careers in horticulture.

Safety

3. Describe safety practices in horticulture.

Plant Physiology

4. Describe vegetative structures and functions in annuals, biennials, and perennials.
   Examples: root for plant anchor and support, stem for plant support, leaf for photosynthesis and respiration
   - Identifying sexual reproductive structures and functions of plants
     Examples: flower, fruit, seed
   - Identifying asexual reproductive structures and functions of plants
     Examples: stem, root, leaf
5. Describe the purpose and use of growth regulators.
   Examples: rooting, growth stimulant, retardant

Growing Media

6. Differentiate soil from soilless media in the horticulture industry.

7. Identify components of soil.
   Examples: sand, silt, clay

8. List macronutrients and micronutrients needed for plant growth.
   - Identifying the function of macronutrients and micronutrients
     Examples: major macronutrients—nitrogen, phosphorus, potassium
               secondary macronutrients—calcium, sulfur, magnesium
               micronutrients—zinc, iron, boron, copper, manganese, carbon,
               hydrogen, oxygen, molybdenum, chloride
   - Recognizing common nutrient deficiency symptoms

9. Design short- and long-term fertilization plans based on information provided by a soil test.
   - Comparing organic and inorganic fertilizers
   - Demonstrating fertilizer application methods
   - Describing pH modification procedures

Greenhouse Facilities

10. Describe various greenhouse designs and types of coverings.
    Examples: designs— even-span, Gothic arch, uneven-span, Quonset, lean-to, attached or
               gutter-connected
             coverings—glass, polyethylene, fiberglass, acrylic, polycarbonate
    - Comparing methods used in controlling greenhouse temperatures
      Examples: misting, heating, ventilating
    - Describing tables or benches used in greenhouses
      Examples: wood, welded wire, prefabricated plastic

Greenhouse and Nursery Crop Production

11. Design greenhouse and nursery crop production schedules.

12. Compare container and field nurseries.

13. Describe techniques for maintaining plants, including pruning, mulching, fertilizing, and
    irrigating.
Plant Identification and Classification

   • Explaining the importance of the binomial classification system

Pest Management

15. Identify plant damage caused by insects.
   • Describing types of pesticides
     Examples: herbicides, miticides, insecticides, fungicides, rodenticides, molluscides, nematocides
   • Describing the Integrated Pest Management (IPM) concept
   • Identifying practices required in the safe use of pesticides

Hydroponics and Vegetable Gardening

16. Compare hydroponic systems used in the horticulture industry.
    Examples: sand culture, gravel culture, bag culture, aeroponic, continuous flow, nutrient film technique

17. Design a vegetable garden plan, including site and suitable plant varieties for the local area.

Technology Applications

18. Utilize various technologies in the horticulture industry.
    Examples: computers, computer software, watering timers, sensors