

Greenhouse Management

1) Analyze the global nature of the horticulture industry and assess the economic impact and technological advancements associated with greenhouse production practices. Create a timeline to summarize the history and development of the greenhouse production industry, citing specific textual evidence.

- 1) -Students will create a timeline of events of the history and development of the greenhouse industry.
-Students will analyze global nature and economic impact of the horticulture industry.

2) Accurately maintain an activity recordkeeping system and apply proper financial recordkeeping skills as they relate to a greenhouse industry. Demonstrate the ability to analyze records by generating reports and completing related applications (i.e., employment application, efficiency reports, SAE applications, and profit and lost statements).

- 2) Students will keep an ongoing record book using skills such as
- employment applications
 - efficiency report
 - SAE applications
 - Profit/loss statements

3) Apply the concepts of occupational safety and industry safety prevention and control standards by interpreting information from industry manuals. a. Assess the purpose of worker protection standards and obtain the worker protection standards student industry certification. b. Review common laboratory safety procedures for tool and equipment operation in horticulture laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.

3) I can demonstrate occupational and industry safety.

I can identify tool and equipment operation in a greenhouse, but not limited to accident prevention.

Assessment: 100% accuracy on Safety Test

4) Describe characteristics of successful greenhouses and create a list of factors for planning and designing greenhouse facilities. Factors must include physical location, market potential, utilities, climatic conditions, and production goals.

4) I can learn characteristics of a successful greenhouse for planning and designing a greenhouse.

I can choose a physical location; find market potential, utilities, climate conditions, and production goals to start a personal commercial greenhouse.

5) Classify greenhouse structures by comparing and contrasting greenhouse construction materials, including but not limited to frames, coverings, and glazing materials. Justify selection of greenhouse construction materials based on cost effectiveness, stability, maintenance, and function.

5) I can identify greenhouse structures by comparing and contrasting materials such as frames, coverings, and glazing materials.

I can research cost effectiveness, stability, maintenance, and function of different materials used to build a greenhouse.

6) Create an annotated model representing research-based practices in greenhouse planning and design and justify the process outlined in the model. The design must include at least Page 3 the following items: structure materials, layout, lighting, bench arrangements, traffic flow, and physical location.

6) I can develop a blueprint for planning and designing a greenhouse to justify the process from a model. the design must include: structure materials, layout, lightening, bench arrangements, traffic flow, and physical location.

7) Compare general maintenance and upkeep requirements for a variety of greenhouses in relation to the type of structure and associated systems. Create a checklist of prescribed maintenance, preventative maintenance, monitoring, and troubleshooting schedules for greenhouse facilities and equipment. Demonstrate the mechanical skills needed for the general maintenance and repair of greenhouses and associated systems (such as basic wiring, plumbing, and general construction).

7) I can identify the general maintenance and upkeep of a greenhouse.

I can compare and contrast different types of structures and associated systems based on upkeep and maintenance.

I can create a check list for maintenance, preventive maintenance, monitoring, for greenhouse facilities and equipment.

I can research and then demonstrate the mechanical skills needed for general maintenance. (basic wiring, plumbing, and general construction).

8) Compare and contrast the attributes of growing mediums. Write an informative essay to describe the major components of soil, and identify basic physical and chemical characteristics of soil including structure and texture.

8) I can compare and contrast the different types of soil.

I can write an informative essay to describe the major components of soil while identifying physical and chemical characteristics.

9) Identify and provide written justification to describe the effects of soil and soilless composition (pH, organic matter content, and mineral content) on plant health and growth. Perform basic soil sampling and testing techniques and interpret test data to formulate corrective actions as needed.

9) I can perform basic soil sampling and testing techniques.

I can interpret test data from soil sampling.

I can use the data to determine the pH, organic matter, and mineral content.

10) Explain the principles of media preparation; develop a check sheet to guide media preparation. Describe the purpose, methods, and importance for sterilizing media. Compare and contrast the cost effectiveness of premix and personal mix media to soil media.)

10) I can explain the principles of soil.

I can develop a check list to guide soil and media preparation.

I can describe the purpose, methods, and importance, and importance for sterilizing media.

I can compare and contrast cost effectiveness of premix and personal mix media to soil media.

11) Apply concepts of scientific taxonomy and industry-specific terminology in distinguishing different species and types of plants. Create a visual chart, brochure, or fact sheet that identifies common plant species used in greenhouse production by classification, care, and use.

11) I can identify basic plant structures components.

I can create an illustrative plant model to identify and differentiate among components.

I can demonstrate the relationship between form and function of major plant structures.

I can demonstrate the different in plant species.

12) Research the basic plant structure components and create an illustrative plant model to identify and differentiate among components. Demonstrate a working knowledge of plant physiology, including: a. The relationship between form and function for major plant structures b. The anatomical and physiological differences of specific plant species

12) I can analyze and support claims regarding the relationships between light, temperature, and water on plant growth.

I can draw conclusions between plant life processes (such as photosynthesis, respiration, and transpiration), plant growth, and maintenance.

15) Analyze the nutrient requirements of plants and assess the importance of the 17 essential plant nutrients for plant health. Identify the chemical and biological processes needed to make nutrients available for growth and maintenance, and distinguish among nutrient deficiency and toxicity signs and symptoms in plants.

15) I can analyze nutrient requirements of plants and assess the importance of the 17 essential plant nutrients of health.

I can identify the chemical and biological processes needed for plant growth.

I can identify nutrient deficiency and toxicity signs.

16) Research case studies to cite specific textual evidence determining the significance of safety hazards associated with fertilizer use. In an informative essay, justify the use of different precautions for the prevention or management of hazards and evaluate the efficacy of prevention measures.

16) I can research case studies to find safety hazards associated with fertilizer use.

I can develop an informative essay to justify the use of different precautions and prevention measures of fertilizers.

17) Identify the basic types of fertilizers and their applications for greenhouse production crops. Differentiate the effects of fertilizer ratios on plant growth and health to hypothesize possible outcomes of each ratio. Calculate proper formulations of fertilizers based upon label directions using systems of equations. Demonstrate in a live setting or in a presentation the ability to follow fertilizer label procedures precisely as they pertain to selection, handling, application, storage, and disposal.

17) I can identify basic fertilizers and their applications for greenhouse crops.

I can differentiate the effects of fertilizer ratios on plant growth and health.

I can practice using formulas to calculate fertilizer equations.

I can calculate proper formulations of fertilizers based upon their label directions using system equations.

I can demonstrate in a live setting or in a presentation the ability to follow fertilizer label procedures (for handling, application, storage and disposal)

18) Differentiate between the methods of sexual and asexual plant propagation by summarizing valid research. Compare and contrast the different techniques of propagation, explaining advantages and disadvantages of each in an informative text. Conduct at least the following: cutting, budding, layering, sowing, germination rate calculation, and seed viability.

18) I can differentiate between sexual and asexual plant propagation.

I can compare and contrast different techniques of propagation.

I can explain advantages and disadvantages of each propagation techniques.

I can conduct at least the following: cutting, budding, layering, sowing, germination rate calculation, and seed viability.

19) Assess the procedures required for producing multiple commercial plant species in a controlled environment, and apply these procedures to produce a variety of specific greenhouse crops. Evaluate environmental factors that affect greenhouse crops to justify management methods.

19) I can assess the procedures required for commercial plant species in a controlled environment.
I can apply these procedures to produce a variety of specific greenhouse crops.
I can evaluate environmental factors that affect greenhouse crops to justify methods.

20) Evaluate the greenhouse climate and recommend the proper climate control equipment to maintain an optimum growing climate, including but not limited to ventilation, humidifiers, heating, cooling, and shading. Provide written justification for each recommendation.

20) I can evaluate the greenhouse climate and control equipment.

21) Demonstrate effective methods to meet water requirements for healthy plant growth. Examine and explain how water pH influences plant growth. Research from multiple technical texts the function and operating principles of greenhouse irrigation systems (such as misting, drip, and overhead systems) to meet watering requirements for the purposes of maintaining optimum moisture level for a variety of plants.

21) I can demonstrate effective methods to meet water requirements for healthy plant growth.
I can examine and explain how water pH influences plant growth.
I can research function and operating irrigation systems in a greenhouse (such as misting, drip, and overhead systems).

22) Determine the economic and aesthetic impact of plant diseases, disorders, and pests. Identify and diagnose the symptoms of common plant diseases, disorders, and pests, and summarize methods of prevention, treatment, and control by drawing evidence from informational texts and relevant scientific literature.

22) I can determine the impacts of plant diseases, disorders and, pest.
I can I can diagnose the common symptoms of plant diseases, disorders, and pests.
I can summarize methods of prevention, treatment, and controls.

23) Identify the types of pesticides and their applications for greenhouse production. Research the safety hazards associated with pesticide use for multiple greenhouse pesticides. Calculate proper formulations of pesticides based upon label directions for specific pests by creating systems of equations that describe numerical relationships.

23) I can identify the types of pesticides and their applications of greenhouse production.
I can research the safety hazards associated with pesticide use for multiple greenhouse pesticides.
I can calculate proper formulations of pesticides based upon label directions for specific pest.

24) Demonstrate in a live setting or in a presentation the ability to follow pesticide procedures precisely according to label and safety guidelines, including selection, handling, personal protective equipment (PPE), application, storage, and disposal.

24) I can demonstrate in a live setting or in a presentation the ability to follow pesticide procedures precisely according to label and safety guidelines. (selection, handling, personal protective equipment, application, storage, and disposal)

25) Evaluate the basic principles and assess the overall effectiveness of integrated pest management (IPM) for controlling greenhouse pests and diseases. Compare with traditional chemical controls.

25) I can evaluate the basic principles and effectiveness of integrated pest management for controlling greenhouse pest and diseases.

I can compare IMP with traditional chemical controls.

26) Examine the roles of hydroponic systems in greenhouse crop production. Describe essential elements of hydroponic systems; explore recent trends and advancements to design a hydroponic system for a specific greenhouse crop.

26) I can examine the roles of hydroponic systems in a greenhouse crop production.

I can research new trends and advancements to design a hydroponic system for a specific greenhouse crop.

27) Apply basic principles of hydroponics to compare hydroponic and soil-based growing methods for providing nutrients to plants. Summarize the advantages and disadvantages of using soilless media systems to evaluate the efficacy for specific crops.

27) I can apply basic principles to compare hydroponic and soil-based growing methods.

I can summarize advantages and disadvantages of using soilless media systems to evaluate specific crops.

28) Debate laws and regulations affecting horticulture businesses. Demonstrate the use of general business and recordkeeping skills necessary to manage a horticultural business, including but not limited to marketing, advertising, product displays, scheduling, inventory control, merchandise handling and profit and loss statements.

28) I can debate laws and regulations affecting horticulture businesses.

I can demonstrate the use of general business and recordkeeping skills (marketing, advertising, product displays, scheduling, inventory control, merchandise handling and profit/ loss statements)

29) Research, develop, and implement greenhouse production schedules for a representative sampling of greenhouse crops that includes at least the following: plant selection, plant material cost (seed, plug, cuttings), growth media, fertilizers, water, testing kits, pricing guides, profit margin, labor, and other expenses.

29) I can research, develop, and implement greenhouse production schedules for a representative sampling of greenhouse crops including: plant selection, plant material cost, growing media, fertilizers, water, testing kits, pricing guides, profit margin, labor, etc...)