

# Introduction to Plant Systems (2021)

## Demonstrating Personal Qualities and Abilities

**1 Demonstrate creativity and innovation. 1**

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**2 Demonstrate critical thinking and problem solving. 2**

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**3 Demonstrate initiative and self-direction. 3**

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**4 Demonstrate integrity. 4**

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**5 Demonstrate work ethic. 5**

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## Demonstrating Interpersonal Skills

**6 Demonstrate conflict-resolution skills. 6**

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**7 Demonstrate listening and speaking skills. 7**

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**8 Demonstrate respect for diversity. 8**

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**9 Demonstrate customer service skills. 9**

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**10 Collaborate with team members. 10**

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## Demonstrating Professional Competencies

**11 Demonstrate big-picture thinking. 11**

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**12 Demonstrate career- and life-management skills. 12**

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**13 Demonstrate continuous learning and adaptability. 13**

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**14 Manage time and resources. 14**

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**15 Demonstrate information-literacy skills. 15**

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**16 Demonstrate an understanding of information security. 16**

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**17 Maintain working knowledge of current information-technology (IT) systems. 17**

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**18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation. 18**

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**19 Apply mathematical skills to job-specific tasks. 19**

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**20 Demonstrate professionalism.** 20

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**21 Demonstrate reading and writing skills.** 21

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**22 Demonstrate workplace safety.** 22

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**Examining All Aspects of an Industry**

**23 Examine aspects of planning within an industry/organization.** 23

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**24 Examine aspects of management within an industry/organization.** 24

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**25 Examine aspects of financial responsibility within an industry/organization.** 25

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**26 Examine technical and production skills required of workers within an industry/organization.** 26

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**27 Examine principles of technology that underlie an industry/organization.** 27

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**28 Examine labor issues related to an industry/organization.** 28

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**29 Examine community issues related to an industry/organization.** 29

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**30 Examine health, safety, and environmental issues related to an industry/organization.** 30

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**Addressing Elements of Student Life**

**31 Identify the purposes and goals of the student organization.** 31

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**32 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.** 32

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**33 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.** 33

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**34 Identify Internet safety issues and procedures for complying with acceptable use standards.** 34

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**Exploring Work-Based Learning**

**35 Identify the types of work-based learning (WBL) opportunities.** 35

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**36 Reflect on lessons learned during the WBL experience.** 36

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**37 Explore career opportunities related to the WBL experience.** 37

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**38 Participate in a WBL experience, when appropriate.** 38

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**Exploring Leadership Opportunities through FFA**

**39 Identify the role of supervised agricultural experiences (SAEs) in agricultural education.** 39

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**40 Participate in an SAE.** 40

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**41 Identify the benefits and responsibilities of FFA membership. 41**

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**42 Describe leadership characteristics and opportunities as they relate to agriculture and FFA. 42**

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**43 Apply for an FFA degree and/or an agricultural proficiency award. 43**

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## **Introducing Botany**

**44 Explain the importance of plant taxonomy. 44**

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**45 Identify major plant parts and their primary functions. 45**

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**46 Explain the characteristics of plants. 46**

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**47 Differentiate between plant life cycles based on classification. 47**

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**48 Describe the growth stages of a plant. 48**

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**49 Illustrate the importance of plant systems in relation to humans. 49**

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**50 Discuss the major disciplinary fields of plant agriculture. 50**

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**51 Research innovative plant breeding technologies. 51**

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## **Understanding Plant Processes**

**52 Explain the life-sustaining processes by which all plants grow and develop. 52**

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**53 Explain the process of osmosis. 53**

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**54 Explain the process of diffusion. 54**

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## **Evaluating the Environmental Stimuli that Affect Plant Growth and Development**

**55 Evaluate the effect of light on plants. 55**

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**56 Evaluate the effect of temperature on plants. 56**

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**57 Evaluate the effect of water on plants. 57**

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**58 Evaluate the effect of carbon dioxide (CO<sub>2</sub>), oxygen, and airflow on plants. 58**

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**59 Evaluate types and components of greenhouses and other indoor plant-growing facilities. 59**

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## **Demonstrating Sexual Propagation in the Production of Plants**

**60 Examine the advantages and disadvantages of sexual propagation in the development of new plant varieties. 60**

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**61 Plant seeds using various methods. 61**

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**62 Analyze scarification and stratification methods that aid in the propagation process. 62**

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**63 Describe the germination process. 63**

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**64 Calculate the germination rates of seeds. 64**

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**65 Demonstrate how to transplant seedlings. 65**

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**Demonstrating Methods of Asexual Propagation in the Production of Plants**

**66 Examine the advantages and disadvantages of asexual propagation in the production of plants. 66**

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**67 Demonstrate how to produce plants through cuttings. 67**

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**68 Demonstrate how to produce plants by layering. 68**

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**69 Demonstrate how to produce plants through division and separation. 69**

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**70 Describe grafting and budding techniques for woody and herbaceous plants. 70**

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**71 Describe how to produce plants through micropropagation. 71**

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**72 Evaluate cultural practices for vegetable crops grown in a greenhouse. 72**

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**Managing Plants: Soil and Soilless Growing Systems**

**73 Evaluate the physical and chemical properties of soil and soilless substrates. 73**

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**74 Amend substrates for optimal plant growth. 74**

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**75 Collect a soil sample for evaluation. 75**

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**76 Analyze soil sample for nutrients and pH. 76**

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**77 Describe hydroponic, aquaponic, and aeroponic plant production. 77**

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**Investigating the Principles of Plant Nutrition**

**78 Evaluate the effects of primary and secondary macronutrients on plant growth and development. 78**

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**79 Evaluate the effects of micronutrients on plant growth and development. 79**

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**80 Diagnose nutrient deficiencies in plants. 80**

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**81 Describe fertilizer application methods. 81**

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**Using Basic Scientific Principles in Plant Pest Management**

**82 Identify the common invertebrates that affect plant growth and development. 82**

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**83 Identify abiotic and biotic factors influencing plant growth and development. 83**

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**84 Classify common weeds that affect plant growth. 84**

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**85 Classify types of vertebrate pests that affect plant growth. 85**

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**86 Explain methods of plant pest management. 86**

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**87 Interpret the information on a pesticide label. 87**

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**88 Identify the application of different types of pesticides. 88**

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**Using Basic Scientific Skills and Principles in Plant Selection**

**89 Identify U.S. Department of Agriculture (USDA) plant hardiness zones and how they affect plant selection. 89**

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**90 Evaluate the common tree species of Virginia. 90**

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**91 Evaluate the common species of agronomic plants grown in Virginia. 91**

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**92 Evaluate common species of fruits and vegetables grown in Virginia. 92**

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**93 Evaluate common species of nursery and landscape horticulture plants grown in Virginia. 93**

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**94 Evaluate common species of turfgrass grown in Virginia. 94**

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**95 Evaluate common species of floriculture crops grown in Virginia. 95**

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**Incorporating Mechanical Skills Related to the Plant Systems Pathway**

**96 Demonstrate safety practices and procedures in various areas associated with agricultural mechanics in plant systems. 96**

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**97 Demonstrate equipment safety and operation as they relate to the plant systems pathway. 97**

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**98 Demonstrate standard measurement techniques in plant systems. 98**

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**99 Demonstrate drawing for agricultural mechanics as it relates to the plant systems pathway. 99**

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**100 Examine metalworking operations as they relate to the plant systems pathway. 100**

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**101 Examine woodworking operations as they relate to the plant systems pathway. 101**

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**102 Examine electrical operations as they relate to the plant systems pathway. 102**

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**103 Examine small-engine operations as they relate to the plant systems pathway. 103**

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**104 Examine plumbing operations as they relate to the plant systems pathway. 104**

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