# Goodheart-Willcox Publisher

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## Goodheart-Willcox Publisher Correlation of *Horticulture Today* ©2017 to Tennessee Department of Education Standards Course: Principles of Plant Science and Hydroculture (6119)

| | STANDARD | CORRELATING PAGES |
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| | **Safety** | |
| 1 | Differentiate general occupational safety prevention and control standards as related to the plant science and hydroculture industry. Apply concepts of safety procedures to complete safety test with 100 percent accuracy. Obtain the worker protection standards student industry certification. | 135, 159–170, 420, 434, 435, 458, 461, 464, 471, 514, 518, 586–587, 592–593, 657, 677, 680, 681, 732, 761, 886–887, 893 |
| | **Plants, Society, and The Environment** | |
| 2 | Investigate the roles of cultivated plants in meeting the food, fiber, fuel, medicinal, aesthetic, and occupational needs of society. Identify and describe, in an informative text, the different domains of the horticulture industry, and examine current issues and trends affecting professionals in the field. Cite specific textual evidence from government publications and news media. | 90–119 |
| 3 | Summarize the impact and patterns of environmental factors on plant biodiversity by examining research from academic journals, news articles, and government publications. Describe important characteristics of the relationships between plants and other organisms, including basic plant-human interactions, plant-animal interactions, and plant adaptation. | 109–112, 161–163, 188, 212, 240, 288–290, 322–323, 343–346, 521, 547, 570–571, 600–601, 692–695, 818–820, 861–863 |
| | **Principles of Soil Science** | |
| 4 | Evaluate, citing specific textual evidence, the physical and chemical properties of soils in an informative text. Perform technical procedures to classify soils by evaluating biotic and abiotic factors such as soil pH, texture, permeability, and water holding capacity. Interpret test results to identity deficiencies and formulate appropriate corrective actions. | 278–309, 577 |

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| 5 | Describing factors that influence soil quality and erosion. Assess the extent to which reasoning and evidence presented in news articles or case studies support the use of a specific soil conservation practice for maintaining healthy growing media for plants. | 106–107, 280–282, 283, 285, 309, 772 |
| 6 | Cite specific textual evidence for the analysis of land selection and conservation practices that ensure optimal productivity and stewardship. Identify factors that affect site selection for plant growth and draw evidence from multiple authoritative sources to appraise and justify management practices that ensure appropriate use of land resources. | 264–265, 286, 299, 314, 325, 450–452, 538–541, 544–547, 548, 602–603, 609–610, 648–652 |
| **Plant Structure and Function** | | |
| 7 | Integrate print and digital sources to create a model depicting the parts of plant cells. Examine the structure and outline the functions of plant cell organelles. | 199–203, 222 |
| 8 | Analyze plant anatomy and physiology and relate key concepts to the processes and requirements involved in plant growth and productivity. | 199–218, 226–239, 248–277 |
| **Plant Nutrition** | | |
| 9 | Analyze the nutrient requirements of plants and assess the importance of essential plant nutrients to plant growth and development. Use visual representations to illustrate the chemical and biological processes, including photosynthesis, that make nutrients available to plants for growth and maintenance. | 226–235, 312–342 |
| 10 | Justify the use of fertilizers as a source of essential plant nutrients. Calculate fertilizer formulations and perform different methods of fertilizer application. | 312–321, 324–332, 483–485, 546, 556–558, 706, 731–732, 764–765, 772 |
| 11 | Research the nutritional factors that influence plant health to identify nutritional deficiencies and disorders. Compile observations to distinguish between the signs of nutrient deficiency in plants and defend recommendations for appropriate treatments. | 248–277, 310–337, 614 |

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| **Plant Diseases and Pests** | | |
| 12 | Research the principles of disease and pest control to plant health, growth, and maintenance. Analyze the effects of different types of plant pests and diseases; prescribe methods for pest and disease prevention and treatment. | 489, 561, 586, 615, 652, 762, 768, 778–857, 876–899 |
| 13 | Demonstrate understanding of common classes of chemicals used for pest management. Gather and evaluate information regarding PPE (Personal Protective Equipment) for chemical application and demonstrate appropriate use of PPE. Create a checklist for safe storage and handling of pesticides. | 160–161, 876–899 |
| **Plant Breeding and Genetics** | | |
| 14 | Analyze the reproductive structures in plants and describe how they function in both sexual and asexual plant reproduction. | 199–218, 235–241, 366–368, 386–387, 393–398, 406, 430 |
| 15 | Investigate the role of DNA, heritability, and genetic applications in plant breeding and compose an informative essay that describes how mutation, gene flow, and adaption influence plant populations. Identify desirable traits in various plant species and predict the probable outcome of genetic crosses based on Mendel's laws. | 182, 186, 200, 201, 230–231, 237, 238, 239–241 |
| **Plant Biotechnology** | | |
| 16 | Distinguish the branches of science that influence plant biotechnology and summarize important historical achievements. Examine the role and importance of genetic principles to improving plant characteristics and perform basic plant DNA extraction procedures. | 92–93, 178–191, 201, 235–241, 430–431, 439–440, 482, 508–510 |
| 17 | Research current and emerging plant biotechnologies and construct an argumentative essay to support a claim supporting or opposing the use of a specific biotechnology in horticulture. Justify and debate ethical, legal, and economic issues surrounding plant biotechnology. | 246, 355, 439–440, 514, 506–535, 786–787, 844 |
| **Fundamentals of Hydroponics and Aquaponics** | | |
| 18 | Evaluate the significance of hydroponics and aquaponics technology as related to sustainable practices and principles. Compare and contrast production systems and techniques utilized in the hydroponics | 508–519 |

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| | and aquaponics fields, including structures and equipment, production methods, and common crops. | |
| 19 | Assess the functions, attributes, and desirable properties of soilless growing media. Write an informative essay to describe the major components of soilless media, identifying basic physical and chemical characteristics. | 295–296, 331, 514 |
| 20 | Apply concepts learned in this course to visually identify common plant and animal species used for hydroponic and aquaponic production, and distinguish between their structural and physiological differences, as well as their specific production applications. | 518–519, 654–655 |
| 21 | Examine the role that water chemistry plays in the development of water quality for plant production. Demonstrate the ability to perform common tests to evaluate water quality factors including pH, hardness, ammonium, nitrate, nitrite, dissolved oxygen, and ammonia levels. | 487 |
| 22 | Analyze the effects of environmental conditions on aquatic plant and animal life. Adjust water quality factors by using quantitative reasoning and appropriate units to calculate proper formulations of chemicals based upon label directions. | 487, 510–512, 514–519 |