

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
Specific Standards and Competencies Included in this Assessment	Location in Text	Related Activities
Related Activity Abbreviations: Thinking Critically TC ; STEM and Academic Activities ST ; Communicating about Horticulture CA ; SAE for ALL Opportunities SAE		
General Knowledge		
Basic Agriculture Science and Technology		
GA-01 Discuss the importance of reading and adhering to pesticide label directions	Pesticide Labels (safety documents) 155 Pesticide Labels 891-894 Figure 33-10 Illustrated label 892	ST #1 p165 SAE #4 p166 TC #1 p797 TC #1-#2 p906 ST #3 p906 CA #1-#2 p906 SAE #4- #5 p907
GA-02 Explain different plant life cycles and give examples	Perennial plants 94 Plant Responses to Temperature 276 Plug Production 362-363 Crown division 404-405 Annual bedding plants 503 Bedding Plants 508 Perennial Plants 509 Small fruits 605 Annuals (weeds) 868 Biennials (weeds) 868 Perennials (weeds) 868 Sedges 871	
GA-03 Identify the major parts of the plant	Plant Parts and Their Functions 222-231	ST #4 p84 ST #4 p197 SAE #2 p198 SAE #3 p880
GA-04 Describe the functions of vegetative plant parts	Plant Parts and Their Functions 222-231	

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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GA-05 Distinguish between plant root systems and how they absorb water and nutrients	Roots 222 Specialized Stem Structures 223-225 Transpiration 245-248 Water Uptake and Nutrient Access 247 Root Zone 283 Capillary Water 301 Chemical Properties of Soil (ions, cations, anions) 304-305 Containers 313 Nutrient Mobility 334 Transplanting 364 Biological Principles of Leaf and Stem Propagation 378-380 Chapter 15 Layering and Division 306- Plant Growth Regulators	
GA-06 Explain ways plants reproduce	Reproduction 249-253 CH 13 Seed Propagation 350-375 CH 14 Stem and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441 CH 17 Tissue Culture: Micropropagation 442-459	CA #1 p374 TC #1 p394 ST #2, #4 p394
GA-07 Describe the role of seed in reproduction, sexually and asexually	Fleshy Fruits 229 Seeds 230 Dry Fruits 230 Main Parts of a Seed 231 Seed Morphology and Development 352-354 Seed Germination 354-356	TC #1 p373
GA-08 Explain the role of flowers in reproducing plants	Flowers 227- Imperfect, Staminate, and Pistillate Flowers 228 Inflorescent Types 228-229	

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GA-09 Describe germination and the conditions under which it occurs	Seed Germination 354-356 Environmental Conditions for Germination 354-356	Hands-On Horticulture: Seed Germination 358
GA-10 Explain the application of vegetative propagation	Cellular Division 250-251 Mitosis and Cytokinesis 250-251	SAE #5 p395
GA-11 Discuss use of improved seeds and cultivars and the importance of improved seed	Plant Breeding Principles 253-255 Seed Propagation Techniques 359-364 Seed Selection 364-367 Seed Production 367-369	Hands-On Horticulture: Crossbreeding Petunias 253 Hands-On Horticulture: Interpreting Seed Labels and Packets 365
GA-12 Explain important factors in plant growth	CH 9 Plant Growth and Development 238-263 Photosynthesis 240-244 Respiration 244-245 Transpiration 245-248 Movement of Solutes 248-249 Reproduction 249-252 CH 10 Environmental Conditions for Growth 264-291	SAE #4 p237 TC #1 p289 SAE #2 p290 SAE #6 p291 CA #2 p321 SAE #4 p348
GA-13 Explain photosynthesis and its importance	Photosynthesis 240-244	ST #1 p84 ST #1 p261 SAE #4 p262 ST #2 p290 SAE #6 p291
GA-14 Explain respiration and transpiration and their importance	Respiration 244-245 Transpiration 245-248	ST #1 p84 TC #1 p261
GA-15 Identify essential plant nutrients for plant growth and reproduction	CH 12 Plant Nutrition 322-349 Essential Elements 324-331 Mineral Nutrient Uptake 331-334 Primary Macronutrients 325-327 Secondary Macronutrients 328-329	ST #3 p347

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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	Micronutrients 329-331	
GA-16 Describe how pests are prevented and methods used to control them after infestation	CH 29 Integrated Pest Management 776-801 Control Measures 781-782 Inspection and Monitoring 782-786 Action Thresholds 786-787 Corrective Actions 787-791	TC #1 p712 ST #4 p772 CA #2 p772 ST #5 p797 CA #2 p797 SAE #2, #4, #5 p798 ST #3 p827 SAE #6 p828
GA-17 Explain supply and demand in agriculture	Supply and Demand 446	
GA-18 Explain the role of the Agriculture Education program and the FFA in personal development	CH 1 Agricultural Leadership 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15 Leadership Characteristics 4-5 Develop a Leadership Path 5-8 Ownership/Entrepreneurship SAE (paragraph 5-6) 36 Written Communication 59-65 Critical Thinking and Research 66-70	Hands-On Leadership: Shipwrecked 33 SAE OP #1 p55 SAE OP #4 p143 ST #5 p261 CA #1 p290 SAE OP #1 p290; SAE OP #1-#3, #5 p321; SAE OP #1 p348; SAE OP #1 p374; SAE OP #1 and #3 p395; SAE OP#1 and #3 p417; SAE OP #1 p441; SAE OP #1 p487 SAE OPs Many more of these discuss personal skills and strategies used in developing these skills.
GA-19 Develop leadership and personal development skills through participation in the FFA	CH 1 Agricultural Leadership 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15	ST #4 p26 SAE OP #5 p27; #1 p290; SAE OP #1-#3, #5 p321; SAE OP #1 p348; SAE OP #1 p374; SAE OP #1 and #3 p395; SAE OP#1 and #3 p417; SAE OP #1 p441; SAE OP #1 p487 SAE OPs Many more of these discuss personal skills and strategies used in developing these skills.

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General Horticulture and Plant Science		
GA-20 Explain the role of Agriculture Education programs and the FFA in personal development	Agricultural Leadership Organizations for Youth 8-10 National FFA Organization 10-20	TC #3 p25 ST #2-#4 p25 SAE #5 p27 ST #3 p54
GA-21 Demonstrate knowledge learned through a Supervised Agricultural Experience (SAE) program	CH 1 Agricultural Leadership 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15	ST #4 p26 SAE OP #5 p27
GA-22 Develop leadership and personal development skills through participation in the FFA	Leadership Characteristics 4-5 Develop a Leadership Path 5-8 Hands-On Leadership: Shipwrecked 33 Ownership/Entrepreneurship SAE (paragraph 5-6) 36 Written Communication 59-65 Critical Thinking and Research 66-70	SAE OP #1 p55 SAE OP #4 p143 ST #5 p261 CA #1 p290 SAE OP #1 p290; SAE OP #1, #2, #3, #5 p321; SAE OP #1 p348; SAE OP #1 p374; SAE OP #1 and #3 p395; SAE OP#1 and #3 p417; SAE OP #1 p441; SAE OP #1 p487 SAE OPs Many more of these discuss personal skills and strategies used in developing these skills.
GA-23 Explore career opportunities in horticulture/plant science through the FFA and the Agriculture Education Program	Student Development 15 Career Development Events 19 Leadership Development Events 20 SAE for ALL Profiles: Sarah Dinger, Agricultural Education Teacher 2 ; SeeTrail Mackey, National FFA Chief Operating Officer 28 ; Brie Arthur, Garden Writer 56 ; Jennifer Frymark, Gotham Greens 86 ; Amanda Thomsen, Horticultural Marketing 114 ; Matt Currin, Landscape Company Owner 144 ; Dr.Andrea Weeks, Plant Taxonomist 178 ; Dr.Tanisha Williams, Bucknell University, Pennsylvania 212 ; Dr.Melodee Fraser, Turfgrass Breeder 238 ; Debbie Roos, Sustainable Agriculture Extension Agent 264 ; Melanie McCaleb, Erosion Control Specialist 292 ; Michelle and Java Bradley, Java’s Composting 322 ;	SAE Opportunities at the end of each chapter

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	Doug Muller, Seed Savers Exchange 350; Mark Weathington, Arboretum Director 376; Joey Owle, Secretary of Agriculture and Natural Resources , Eastern Band of Cherokee Indians 396; Dr.Travella Free, State Program Leader and Associate Extension Professor, 4-H Youth Development , Kentucky State University 418; Ty Strode, Vice President and Marketing Director 442; Neil Devaney, Account Executive, Greenhouse Sales 460; Josh Tsujimura, Falls Revival Nursery 488; Megan Cain, The ZEN Succulent 516; Alan Erwin, Panther Creek Nursery 542; Ariana de Leña, Kamayan Farm 570; Robin Hawley, Sokol Blosser Winery 600; Tyler McIntyre, Landvision Design 632; Hannah Ross Clarke, Floral Designer and Grower 664; Yuko Frazier, Senior Project Designer, Ambius 690; Andy Smith, Erosion Control, Eco Turf 714; Todd Lawrence, Golf Course Superintendent 742; Angélica Varela Semillas Plant Studio , Chicago 774; The Bug Chicks , Kristie Reddick and Jessica Honaker 802; ; Kristine Dyer, BioWorks 830; Jarred Driscoll, Regulatory Weed Specialist , North Carolina Department of Agriculture and Consumer Services 862; Kevin Whitten, Gunters Greenhouses 884	
GA-24 Explore the professional agricultural organizations associated with the course content	Agricultural Leadership Organizations for Youth 8-10 National FFA Organization 10-20	
GA-25 Explain the three phases of plant life (dormancy, vegetative, reproductive)	Dormancy, 276–277, Seed Dormancy 356–359	SAE #6 p375 ST #1 p855
GA-26 Describe the difference between annuals, biennials, and perennials	Perennial Plants, 94, 509 Biennial Plants, 278, 868 Plant Responses to Temperature 276 Plug Production 362-363 Crown Division 404-405 Annual bedding plants 503 Bedding Plants 508 Perennial Plants 509	

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	Small Fruits 605 Annuals (weeds) 868 Biennials (weeds) 868 Perennials (weeds) 868	
GA-27 Identify vegetative structures and functions of plant parts (i.e., leaves, stems, roots)	Plant Parts and Their Functions 222-231	
GA-28 Identify sexual reproductive structures and functions of plant parts (i.e., flower, fruit, seeds)	Plant Parts and Their Functions 222-231 Reproduction 249-252	CA #1 p374 TC #1 p394 ST #2, #4 p394
GA-29 Identify asexual reproductive structures and functions of plant parts (i.e., stems, roots)	Plant Parts and Their Functions 222-231 Reproduction 249-252	CA #1 p374 TC #1 p394 ST #2, #4 p394
GA-30 Discuss the importance of plant propagation	Reproduction 249-253 CH 13 Seed Propagation 350-375 CH 14 Stem and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441 CH 17 Tissue Culture: Micropropagation 442-459	
GA-31 Explain the difference between sexual and asexual propagation	Reproduction 249-253 Sexual Reproduction 251-252	
GA-32 Describe the factors involved in planting seeds	Seed Germination 354-356 Environmental Conditions for Germination 354-356	ST #1 p320
GA-33 Discuss the various methods of vegetative propagation and identify each method	Reproduction 249-253 CH 13 Seed Propagation 350-375 CH 14 Stem and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441	

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	CH 17 Tissue Culture: Micropropagation 442-459	
GA-34 Explain the difference between separation and division in plant propagation	CH 15 Layering and Division 396-417	
GA-35 Describe soil materials and structure	CH 11 Soils and Media 292-321 Physical Properties of Soil 296-302 Biological Properties of Soil 302-303 Chemical Properties of Soil 303-307 Soilless Media 307-310	ST #2 p197 STEM Connection: Using the Soil Triangle 308 TC #1 p261 ST #1 p290 TC #1 p320 ST #5 p320
GA-36 Describe the components and functions of a good growing medium	CH 11 Soils and Media 292-321 Physical Properties of Soil 296-302 Biological Properties of Soil 302-303 Chemical Properties of Soil 303-307 Soilless Media 307-310	STEM Connection: Using the Soil Triangle 308 ST #1 p320 CA #2 p321 TC #1 p568
GA-37 Name the nutrients needed for plant growth	CH 12 Plant Nutrition 322-349 Essential Elements 324-331 Mineral Nutrient Uptake 331-334 Primary Macronutrients 325-327 Secondary Macronutrients 328-329 Nutrient Sources 334-338 Fertilizer Calculations 339-340	SAE #6 p321 ST #1, #3 p347 CA #2 p348 SAE #2, #3, #5, #6 p348 TC #2 p373
GA-38 Identify sexual reproductive structures and functions of plant parts (i.e., flower, fruit, seeds)	Plant Parts and Their Functions 222-231 Reproduction 249-252	CA #1 p374 TC #1 p394 ST #2, #4 p394
GA-39 Identify asexual reproductive structures and functions of plant parts (i.e., stems, roots)	Plant Parts and Their Functions 222-231 Reproduction 249-252	

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
Specific Standards and Competencies Included in this Assessment	Location in Text	Related Activities
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GA-40 Discuss the importance of plant propagation	Reproduction 249-253 CH 13 Seed Propagation 350-375 CH 14 Stem and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441 CH 17 Tissue Culture: Micropropagation 442-459	CA #1 p374 TC #1 p394 ST #2, #4 p394
GA-41 Explain the difference between sexual and asexual propagation	Reproduction 249-253	
GA-42 Describe the factors involved in planting seeds	Seed Germination 354-356 Environmental Conditions for Germination 354-356	ST #1 p320
GA-43 Discuss the various methods of vegetative propagation and identify each method	Reproduction 249-253 CH 13 Seed Propagation 350-375 CH 14 Stem and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441 CH 17 Tissue Culture: Micropropagation 442-459	
GA-44 Explain the difference between separation and division in plant propagation	CH 15 Layering and Division 396-417	
GA-45 Describe soil materials and structure	CH 11 Soils and Media 292-321 Physical Properties of Soil 296-302 Biological Properties of Soil 302-303 Chemical Properties of Soil 303-307 Soilless Media 307-310	ST #2 p197 STEM Connection: Using the Soil Triangle 308 TC #1 p261 ST #1 p290 TC #1 p320 ST #5 p320
GA-46 Describe the components and functions of a good growing medium	CH 11 Soils and Media 292-321 Physical Properties of Soil 296-302 Biological Properties of Soil 302-303	STEM Connection: Using the Soil Triangle 308 ST #1 p320 CA #2 p321

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
Specific Standards and Competencies Included in this Assessment	Location in Text	Related Activities
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	Chemical Properties of Soil 303-307 Soilless Media 307-310	TC #1 p568
GA-47 Name the nutrients needed for plant growth	CH 12 Plant Nutrition 322-349 Essential Elements 324-331 Mineral Nutrient Uptake 331-334 Primary Macronutrients 325-327 Secondary Macronutrients 328-329 Nutrient Sources 334-338 Fertilizer Calculations 339-340	SAE #6 p321 ST #1, #3 p347 CA #2 p348 SAE #2, #3, #5, #6 p348 TC #2 p373
GA-48 Identify common nutrient deficiency symptoms	CH 12 Plant Nutrition 322-349	SAE #6 p321 TC #1-#2 p347
GA-49 Describe pH modification	Changing pH 579-580	TC #2 p320
GA-50 Explain fertilizers and fertilization	Slow-release fertilizers 310 STEM Connection: Mulch and Soil Nutrition 311 Nitrogen Application 326 Nutrient Sources 334-339 Complete and Incomplete Fertilizers 493-494 Soluble and Insoluble Fertilizers 494-495 Organic and Inorganic Fertilizers 495 Sustainable Horticulture: Human Waste as Fertilizer 560 Fertilizer (vegetables) 580 Nutrient Management (orchards) 617 Plant Nutrition (indoor) 704 Fertilizing (landscape) 728-729 Fertilization (turfgrass) 754-755 Fertilization (turfgrass) 759-761 Fertilization (sprigging turfgrass) 766	

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Related Activity Abbreviations: Thinking Critically TC ; STEM and Academic Activities ST ; Communicating about Horticulture CA ; SAE for ALL Opportunities SAE		
GA-51 Analyze the difference between organic and inorganic fertilizers	Inorganic Fertilizers 337-339 Organic Materials 335-337 Organic Mulches 312-313 Organic and Inorganic Fertilizers 495	
GA-52 Demonstrate fertilizer application methods	Methods of Fertilizer Application 340-341 Nutrient Management 559-560 Fertilizer Post-Plant Application 560	CA #1 p772 SAE #6 p773
GA-53 Identify common insects, weeds, diseases, and physiological disorders	Pests 777-781 Pest Identification 786 Recordkeeping and Evaluation Pests and Disorders Identification (illustrated glossary) 799-801 CH 30 Insects 802-829 Anatomy (insects) 804-811 Growth and Development (insects) 811-812 Chemical Signals (insects) 812-814 Taxonomy (insects) 814-816 Agricultural Pests and Beneficials (insects) 816-819 Types of Disease 837-838 Disease Cycle 838-840 Signs and Symptoms of Disease 840 Disease Index 843-849 Disease Identification (illustrated glossary) 857-861 CH 32 Weeds 862-883 Weed Characteristics 865-868 Weed Biology 868-869 Weed Identification 869-871 Weed Identification (illustrated glossary) 881-883	

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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GA-54 Diagram the external structure of an insect	Anatomy 804-811 Figure 30-3 Antenna Types 806 Figure 30-9 Ant anatomy 808	
GA-55 Trace the life cycles of insects	CH 30 Insects 802-829 Growth and Development (insects) 811-812	
GA-56 Describe the type of damage inflicted by weeds	CH 32 Weeds 862-883 Weed Characteristics 865-868 Weed Biology 868-869	TC #1-#2 p879 ST #2 p879 CA #1 p879
GA-57 Describe the types of plant diseases	CH 31 Disease Management 830- Disease Development 833-835 Organisms That Cause Disease 835-837 Types of Disease 837-838 Disease Cycle 838-840 Signs and Symptoms of Disease 840-842	TC #2 p630 TC #1 p797 TC #1-#2 p855 ST #2, #5 p855 CA #1, #2 p855 SAE #3 p856
GA-58 Identify the proper methods of controlling pests	CH 29 Integrated Pest Management 776-801 Integrated Pest Management for Lawns 757-758 Creating an IPM 776-777 Control Measures 781-782 Inspection and Monitoring 782-786 Action Thresholds 786-787 Corrective Actions 787-791 CH 31 Disease Management 830-861 Managing Plant Diseases 842-843 Weed Management 871-875 CH 33 Pesticide Management and Safety 884-907	TC #1 p797 CA #1 p906
GA-59 Describe the containers used in plant production	Containers 313-314 Containers 500	ST #6 p320 ST #1 p568

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
Specific Standards and Competencies Included in this Assessment	Location in Text	Related Activities
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	Types of Containers 547-548	
GA-60 Analyze the advantages and disadvantages of each type of plant growing container	Containers 313-314 Containers 500 Container Plants 506 STEM Connection: Container Engineering 546	ST #6 p320 ST #1 p568
GA-61 Describe the different types of watering methods	Sustainable Horticulture: Drip Irrigation 120 Overhead Irrigation 281 Irrigation 283-284 Surface Irrigation 284 Sprinkler Irrigation 284 Drip Irrigation 284 Fertigation 340-341 Subirrigation (greenhouse) 363 Irrigation (greenhouse) 474-476 Water (greenhouse) 496-497 Rainwater Catchment 496 Automated Irrigation Sensors 498 Water Management (nursery) 554-559 Water (vegetable irrigation) 577-579	
GA-62 List the advantages and disadvantages of each type of watering system	Sustainable Horticulture: Drip Irrigation 120 Overhead Irrigation 281 Irrigation 283-284 Surface Irrigation 284 Sprinkler Irrigation 284 Drip Irrigation 284 Fertigation 340-341 Subirrigation (greenhouse) 363 Irrigation (greenhouse) 474-476	

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	Water (greenhouse) 496-497 Rainwater Catchment 496 Automated Irrigation Sensors 498 Water Management (nursery) 554-559 Water (vegetable irrigation) 577-579	
GA-63 Describe the processes of photosynthesis and factors that affect photosynthesis in plants	Photosynthesis 240-244 Respiration 244-245 Transpiration 245-248 Movement of Solutes 248-249	ST #1 p84 ST #1 p261 SAE #4 p262 ST #2 p290
GA-64 Describe the processes of respiration and factors that affect respiration in plants	Photosynthesis 240-244 Respiration 244-245 Transpiration 245-248 Movement of Solutes 248-249	ST #1 p84 TC #1 p261
GA-65 Demonstrate basic understanding of education requirements/skills needed for various plant science careers	Career Connections are found throughout the text: Horticultural Communications 80; Professional Certifications in Horticulture 135; Horticulture Business 137; Plant Taxonomy 192; Plant Biology 232; Plant Science 256; Environmental Horticulture 285; Soil Science 315; Plant Nutrition 342; Seed Propagation 369; Stem and Leaf Propagation 390; Layering and Division 412; Grafting and Budding 436; Micropropagation 455; Greenhouse Structures 482; Greenhouse Production 510; Nontraditional Horticulture 537; Nursery Production 564; Olericulture 594; Pomology 625; Landscape Design 658; Floriculture Industry 684; Interior Plantscaping Business and Careers 708; Landscape Installation and Maintenance 735; Sports Turf Industry 767; Integrated Pest Management 792; Entomology 822; Disease Management 850; Weed Management 875; Pesticide Management and Safety 902	SAE #1 p26 ST #6 p54 CA #1 p54 SAE #1 p55 SAE #5 p85 CA #1 p237 SAE #1, #3 p262 CA #1 p290 SAE #1 p290 CA #1 p321 SAE #1 p321 SAE #1 p348 SAE #1, #3 p374 SAE #1 p395 SAE #1 p459 SAE #1 p487 SAE #1 p514 SAE #1 p568 SAE #1 p599 SAE #1 p631 SAE #1 p663 SAE #1 p689 SAE #2 p713 SAE #1 p741 SAE #1 p773 SAE #1 p798 SAE #1 p828 SAE #1 p856

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		CA #3 p417 SAE #1 p417 SAE #3 p441 SAE #1 p880 SAE #1 p907
GA-66 Give a basic understanding of olericulture, arboriculture, pomology, agronomy, Floriculture, etc.	Agronomy 89-90 Olericulture 91-92, 576 Pomology 92, 604 Viticulture 93 Floriculture 92-94	
Nursery and Landscape		
GA-67 Explain the role of the Agriculture Education program and the FFA in personal development	Agricultural Leadership Organizations for Youth 8-10 National FFA Organization 10-20	TC #3 p25 ST #2-#4 p25 SAE #5 p27 ST #3 p54
GA-68 Demonstrate knowledge learned through a Supervised Agriculture Experience (SAE) program	CH 1 Agricultural Leadership 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15	ST #4 p26 SAE OP #5 p27
GA-69 Develop leadership and personal development skills through participation in the FFA	Leadership Characteristics 4-5 Develop a Leadership Path 5-8 Hands-On Leadership: Shipwrecked 33 Ownership/Entrepreneurship SAE (paragraph 5-6) 36 Written Communication 59-65 Critical Thinking and Research 66-70	SAE OP #1 p55 SAE OP #4 p143 ST #5 p261 CA #1 p290 SAE OP #1 p290; SAE OP #1, #2, #3, #5 p321; SAE OP #1 p348; SAE OP #1 p374; SAE OP #1 and #3 p395; SAE OP#1 and #3 p417; SAE OP #1 p441; SAE OP #1 p487 SAE OPs Many more of these discuss personal skills and strategies used in developing these skills.

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GA-70 Explore career opportunities in nursery/landscaper through the FFA and Agriculture Education program	<p>tudent Development 15 Career Development Events 19 Leadership Development Events 20</p> <p>SAE for ALL Profiles: Sarah Dinger, Agricultural Education Teacher 2; SeeTrail Mackey, National FFA Chief Operating Officer 28; Brie Arthur, Garden Writer 56; Jennifer Frymark, Gotham Greens 86; Amanda Thomsen, Horticultural Marketing 114; Matt Currin, Landscape Company Owner 144; Dr.Andrea Weeks, Plant Taxonomist 178; Dr.Tanisha Williams, Bucknell University, Pennsylvania 212; Dr.Melodee Fraser, Turfgrass Breeder 238; Debbie Roos, Sustainable Agriculture Extension Agent 264; Melanie McCaleb, Erosion Control Specialist 292; Michelle and Java Bradley, Java’s Composting 322; Doug Muller, Seed Savers Exchange 350; Mark Weathington, Arboretum Director 376; Joey Owle, Secretary of Agriculture and Natural Resources, Eastern Band of Cherokee Indians 396; Dr.Travella Free, State Program Leader and Associate Extension Professor, 4-H Youth Development, Kentucky State University 418; Ty Strode, Vice President and Marketing Director 442; Neil Devaney, Account Executive, Greenhouse Sales 460; Josh Tsujimura, Falls Revival Nursery 488; Megan Cain, The ZEN Succulent 516; Alan Erwin, Panther Creek Nursery 542; Ariana de Leña, Kamayan Farm 570; Robin Hawley, Sokol Blosser Winery 600; Tyler McIntyre, Landvision Design 632; Hannah Ross Clarke, Floral Designer and Grower 664; Yuko Frazier, Senior Project Designer, Ambius 690; Andy Smith, Erosion Control, Eco Turf 714; Todd Lawrence, Golf Course Superintendent 742; Angélica Varela Semillas Plant Studio, Chicago 774; The Bug Chicks, Kristie Reddick and Jessica Honaker 802; ; Kristine Dyer, BioWorks 830; Jarred Driscoll, Regulatory Weed Specialist, North Carolina Department of Agriculture and Consumer Services 862; Kevin Whitten, Gunters Greenhouses 884</p>	
GA-71 Define and describe the overall structure, scope, and importance of the green industry	CH 4 The Horticulture Industry 86-113	

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GA-72 Explore career opportunities in the green industry related to nursery and landscape	Career Connections are found throughout the text: Agricultural Leadership and Education 22; Agricultural Business and Government 50; Horticultural Communications 80; Horticulture Industry 107; Writing Professional Emails 128; Professional Certifications in Horticulture 135; Horticulture Business 137; Horticultural Safety 162; Plant Taxonomy 192; Plant Biology 232; Plant Science 256; Environmental Horticulture 285; Soil Science 315; Plant Nutrition 342; Seed Propagation 369; Stem and Leaf Propagation 390; Layering and Division 412; Grafting and Budding 436; Micropropagation 455; Greenhouse Structures 482; Greenhouse Production 510; Nontraditional Horticulture 537; Nursery Production 564; Olericulture 594; Pomology 625; Landscape Design 658; Floriculture Industry 684; Interior Plantscaping Business and Careers 708; Landscape Installation and Maintenance 735; Sports Turf Industry 767; Integrated Pest Management 792; Entomology 822; Disease Management 850; Weed Management 875; Pesticide Management and Safety 902	SAE #1 p26 CA #1 p54 SAE #1 p55 TC #1 p83 SAE #1, #3, #5 p85 SAE #1 p112 ST #2 p141 CA #1 p237 SAE #2 p237 ST #5 p261 SAE #1, #3 p262 CA #1 p290 SAE #1 p290 CA #1 p321 SAE #1, #3 p348 SAE #1, #3 p374 SAE #1 p395 CA #3 p417 SAE #1, #3 p417 SAE #3 p441 SAE #1 p459 SAE #1 p487 SAE #1 p514 SAE #4 p541 SAE #1 p568 SAE #1 p599 SAE #1 p631 SAE #1 p663 SAE #1 p689 SAE #1 p713 SAE #1 p741 SAE #1 p773 SAE #1 p798 SAE #1 p828 SAE #1 p856 SAE #1 p880 SAE #1 p907
GA-73 Identify hand and power tools and equipment used in landscape operations	CH 6 Worker and Tool Safety 144-177 Equipment and Supplies Identification (illustrated glossary 168-177)	ST #2 p166 ST #4 p879
GA-74 Demonstrate proper tool and equipment safety procedures in nursery and landscape operations	Safety First: Unplug Equipment before Servicing 481 Checking and Maintaining Equipment 158 Mower Safety and Maintenance 761-762	ST #2 p166 ST #4 p879
GA-75 Demonstrate proper maintenance and storage for tools and equipment	Maintaining Tools and Equipment 157-159 Mower Safety and Maintenance 761-762 Checking and Maintaining Equipment 158	ST #2 p166 ST #4 p879

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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GA-76 Classify plants using horticultural characteristics (i.e., trees, shrubs, vines, groundcovers, etc.)	CH 7 Plant Taxonomy 178-211 A System of Botanical Classification 181-189 Plant Keys 189-191	CA #2 p197 SAE #5 p198
GA-77 Identify plants by their environmental needs (sun/shade, drought tolerant, etc.)	Plant Keys 189 Herbaria 189-191	ST #4 p84 ST #4 p197 SAE #2 p198
GA-78 Identify common landscape and nursery plants by common and scientific names	CH 7 Plant Taxonomy 178-211 Plant Identification (illustrated glossary) 199-211	ST #4-#5 p197 CA #2 p197 SAE #2 p198 SAE #3 p198 ST #2 p855
GA-79 Describe soil structural characteristics that affect fertility and plant growth	CH 11 Soils and Media 292-321 Physical Properties of Soil 296-302 Biological Properties of Soil 302-303 Chemical Properties of Soil 303-307 Soilless Media 307-310	STEM Connection: Using the Soil Triangle 308 CA #2 p321 TC #1 p568
GA-80 Identify types, characteristics, and uses of soil amendments	CH 11 Soils and Media Mulch 310-313 Organic Materials 335-337 Inorganic Fertilizers 337-339 Cover Crops 300	ST #2 p111 ST #1, #3 p320 SAE #4 p348
GA-81 Demonstrate soil testing procedures and prescribe treatments based on soil test results	Soil Texture by Feel Figure 11-5 298 Soil Testing 305-307	STEM Connection: Using the Soil Triangle 308 Hands-On Horticulture: Taking A Soil Test and Reading a Soil Report ST #3 p320 SAE #4, #6 p321

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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Related Activity Abbreviations: Thinking Critically TC ; STEM and Academic Activities ST ; Communicating about Horticulture CA ; SAE for ALL Opportunities SAE		
GA-82 Explain the importance of preparing beds for planting	Garden or Native Soil 307-310	
GA-83 Determine the area of planting sites	Garden Plan Figure 22-19 589 Tools of Landscape Design 644-647 STEM Connection: Calculating Mulch 651	ST #3 p84 ST #2, #4 p111 ST #4 p347 ST #3 p394
GA-84 Calculate the amount of fertilizer, lime, and/or other soil amendments needed for the planting site	Fertilizer Calculations 339-340	SAE #6 p773 ST #1 p772
GA-85 Identify equipment used in site analysis and landscape drawing processes	Tools of Landscape Design 644-647	ST #2 p166 TC #2 p712
GA-86 Assess client and site needs	The Design Process 635-638	CA #1 p740 ST #4 p740
GA-86 Utilize standard landscape drawing practices, including landscape symbols, computer programs, tools, etc.	CH 24 Landscape Design 632- Drawing Board or Computer-Aided Design 638 Tools of Landscape Design 644-647 Landscape Design Plans 716-718	TC #1 p662 ST #5 p740
GA-87 Apply the principles of good landscape design	Elements and Principles of Landscape Design 638-644 Xeriscaping Design 647-652	TC #1 p662 ST #5 p662 SAE #4 p663 ST #2 p688
GA-88 Select appropriate landscape plant materials	Plant Selection 273-274 Plant Selection 648	TC #3 p261 ST #4 p394
GA-89 Identify and practice correct planting procedures	Transplants 590 Plant Selection 648 Planting the Design 723-726	

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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	Container-Grown 724 Balled-and-Burlapped 724-725 Bare Root 725	
GA-90 Identify and practice mulching applications	Soil Bulk Density 300 Mulch 310-313 Inorganic Mulches 310-312 Organic Mulches 312-313 Mulchmat 311 STEM Connection: Mulch and Soil Nutrition 311 Figure 11-18 Organic and Inorganic Mulches 312 Mulches 583 Mulch 650-651 STEM Connection: Calculating Mulch 651 Mulch 704 Mulching 732	ST #2 p740 ST #3 p84 SAE #1, #4 p321
GA-91 Identify and practice fertilizer applications	Fertilizer Calculations 339-340 Methods of Fertilizer Application 340-341 Fertilizer Injectors 479 Methods of Application 730	TC #2 p347 ST #4 p347 SAE #4 p348 ST #2 p772 CA #1 p772
GA-92 Describe and practice proper pruning techniques	Pruning 272 Pruning (nurseries) 563 Pruning and Training (trellises for vine fruit) 609-610 Pruning and Training 613-617 Training and Pruning 705 Pruning 730-731	ST #3 p740 CA #1 p630
GA-93 Calculate the cost of a landscape plan and installation	Billing 637 CH 27 Landscape Installation and Maintenance 714-741	

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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GA-94 Identify landscape pests	Pests 777-781 Pest Identification 786 Pests and Disorders Identification (illustrated glossary) 799-801	ST #2 p84 ST #1 p111 CA #2 p772 ST #1 p797 TC #2 p797 CA #3 p797
GA-95 Analyze damage to landscape plants from pests	Feeding Behaviors and Plant Damage 816-819	TC #2 p797 CA #3 p797
GA-96 Identify different types of management approaches to control pests	CH 29 Integrated Pest Management 776-801	ST #2, #3, #5 p906
GA-97 Explain the concepts of integrated pest management	CH 29 Integrated Pest Management 776-801	SAE #2 p798 SAE #2 p907
GA-98 Explain the relationship between water and plant growth	Transpiration 245-248 Movement of Solutes 248-249 Water 282-284	ST #1 p84 TC #1 p261
GA-99 Judge types of irrigation systems based on plant needs, effectiveness, feasibility, etc.	Sustainable Horticulture: Drip Irrigation 120 Overhead Irrigation 281 Irrigation 283-284 Surface Irrigation 284 Sprinkler Irrigation 284 Drip Irrigation 284 Fertigation 340-341 Subirrigation (greenhouse) 363 Irrigation (greenhouse) 474-476 Water (greenhouse) 496-497	TC #2 p458 CA #1 p514 ST #3 p772

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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	Rainwater Catchment 496 Automated Irrigation Sensors 498 Water Management (nursery) 554-559 Water (vegetable irrigation) 577-579 Efficient Irrigation 649-650	
GA-100 Practice effective watering methods and techniques	Sustainable Horticulture: Drip Irrigation 120 Overhead Irrigation 281 Irrigation 283-284 Surface Irrigation 284 Sprinkler Irrigation 284 Drip Irrigation 284 Fertigation 340-341 Subirrigation (greenhouse) 363 Irrigation (greenhouse) 474-476 Water (greenhouse) 496-497 Rainwater Catchment 496 Automated Irrigation Sensors 498 Water Management (nursery) 554-559 Water (vegetable irrigation) 577-579	
GA-101 Identify and classify turfgrass species	Turf Applications 746-748 Turfgrass Morphology and Types 748-753 Turf Selection and Timing 753-755	TC #1 p111 ST #4 p111 CA #1 p772
GA-102 Select turf grasses for specific purposes (i.e., athletic fields, golf courses, lawns, shade areas)	Turf Applications 746-748 Turfgrass Morphology and Types 748-753 Turf Selection and Timing 753-755	TC #1 p111 ST #4 p111 CA #1 p772
GA-103 Identify the seasonality of landscape and nursery jobs	Economic Impacts 105 Seasonal Production 575	TC #2 141

NOCTI State Customized Credential Blueprint for Plant Science/Horticulture (Georgia)		
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<p>Blueprint Contents: General Assessment Information, Written Assessment Information, Specific Competencies Covered in the Test, and Sample Written Items Test Type: The Plant Science/Horticulture assessment was developed based on standards used in the state of Georgia and contains a multiple-choice and performance component. This assessment is meant to measure technical skills at the occupational level and includes items which gauge factual and theoretical knowledge. Revision Team: The assessment content is based on input from Georgia educators who teach in career and technical education programs. CIP Code 1.0601- Applied Horticulture/Horticultural Operations, General; CTE Career Cluster 1 Agriculture, Food, and Natural Resources; o★net in*it 45-2092.00 - Farmworkers and Laborers, Crop, Nursery, and Greenhouse</p>		