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Correlation of

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to

Plant and Soil Science 1, Exam 140
Precision Exams by YouScience

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The correlation chart below lists the standards, objectives, and indicators for the Plant and Soil Science exam 140 in the left column. Corresponding content from *Horticulture Today* that can be used by a student to help achieve the standard, objective, or indicator is listed in the right column.

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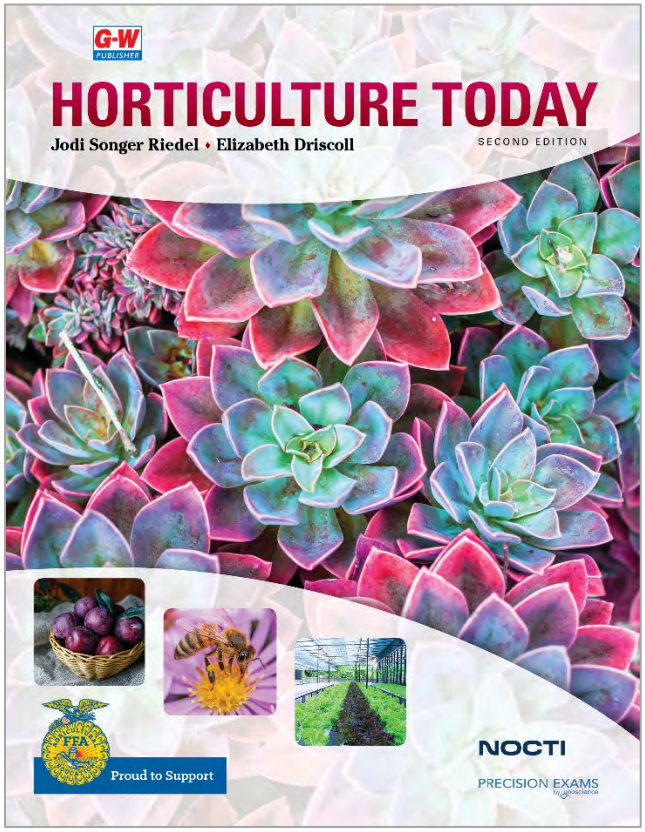

Standards / Objectives / Indicators	Textbook Pages
End of Chapter abbreviations: Thinking Critically **TC**; STEM and Academic Activities **ST**; Communicating about Horticulture **CA**; SAE for ALL Opportunities **SAE OP**	
Standard 1 Students will develop personal, leadership, and career skills through students organization participation	
Objective 1 Assess the role of student organization participation in developing personal and leadership skills.	CH 1 Agricultural Leadership 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15

Standards / Objectives / Indicators	Textbook Pages
1. Identify important personal skills and the strategies used in developing the skills.	Leadership Characteristics 4-5 Develop a Leadership Path 5-8 Hands-On Leadership: Shipwrecked 33 Ownership/Entrepreneurship SAE (paragraph 5-6) 36 SAE OP #1 p55 Written Communication 59-65 Critical Thinking and Research 66-70 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.
2. Identify important leadership skills and the role of student organization participation in developing the skills.	CH 1 Agricultural Leadership pp. 2-27 Agricultural Leadership Organizations for Youth 8-10 Leadership Development in FFA 12-15 ST #4 p26 SAE OP #5 p27
Objective 2 Assess the role of student organization participation in developing career skills.	Agricultural Leadership Organizations for Youth 8-10 National FFA Organization 10-20
1. List and describe proficiency awards appropriate for horticulture	Agricultural Proficiency Awards 47-49
2. List and describe career development events appropriate for horticulture.	Career Development Events 19 Leadership Development Events 20
3. Relate the importance of supervised agricultural experience to student organization achievement.	Supervised Agricultural Experience 20-21 CH 2 Experiential Learning: SAE 28-55 SAE and Agricultural Education 30-33 The SAE Program Process 41-47
4. Utilize student organization and supervised agricultural experience participation to gain advanced degrees of student organization membership.	SAE Awards and Recognitions 47-49 **SAE for ALL Opportunities** are included at the end of each chapter.
STANDARD 2 Students will explain the maintenance and expansion of supervised agricultural experience programs	
Objective 1 Maintain and use agricultural experience records	Supervised Agricultural Experience 20-21 Coordinate 45 Keep Records 46
1. Explain how agricultural experience records are maintained from year to year.	Keep Records 46

Standards / Objectives / Indicators	Textbook Pages
2. Explain how to summarize and analyze agricultural experience records.	Keep Records 46 ST #3 p25
Objective 2 Devise long-range plans for expanding agricultural experience programs.	Goals 45
1. Evaluate the overall quality of a current agricultural experience and determine how to make it more productive or profitable.	SAE OP #6 291 ST #3 374 SAE OP #5 375 SAE OP #4 441
2. Explain factors that should be considered in expanding an agricultural experience program.	CH 2 Experiential Learning: SAE 28-55
3. Explain how placement agricultural experience and ownership agricultural experience programs may be expanded.	Placement/Internship SAE 36-38 SAE OP #6 291
STANDARD 3 Students will explain the history, importance, and scope of plant science	
Objective 1 Discuss the history of agriculture.	CA #2 p26 ST #6 p26 SAE OP #6 27 CH 4 The Horticulture Industry 86-113
1. Explain how the science of agriculture helped develop civilization, including agronomic, horticultural, and forestry plants.	What Is Plant Science? 89-90 CA #1 262 CA #1 486 ST #4 827
2. Identify the major innovators and milestones in the advancement of agriculture.	History of the National FFA Organization 10-11 History Connection Cesar Chavez 148 Carolus Linnaeus 181 Asa Gray 187 Marie Clark Taylor 218 George Washington Carver 245 J.C. Raulston 387 Percy Julian 494 Frederick Law Olmsted
Objective 2 Discuss the importance of plant science.	What Is Plant Science? 89-90 Hands-On Horticulture: Which Horticultural Science Is It? 89 ST #3 237 ST #3 261
1. Identify the various roles of plants in everyday life.	CH 4 The Horticulture Industry 86-113

Standards / Objectives / Indicators	Textbook Pages
2. Identify agriculturally important plants and explain their uses.	CH 4 The Horticulture Industry 86-113
Objective 3 Identify career opportunities in plant science.	See #2
1. Identify and describe the major areas of plant science.	What Is Plant Science? 89-90 Hands-On Horticulture: Which Horticultural Science Is It? 89
2. Identify career opportunities in plant science and determine the education and training they entail. (continued)	**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 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 (continued)

(continued) **2.** Identify career opportunities in plant science and determine the education and training they entail.	Kristine Dyer, BioWorks 830 Jarred Driscoll, Regulatory Weed Specialist, North Carolina Department of Agriculture and Consumer Services 862 Kevin Whitten, Gunters Greenhouses 884 **Career Connections** Agricultural Leadership and Education 22 Agricultural Business and Government 50 Horticultural Communications 80 Horticulture Industry 107 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 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 **Activities** ST #6 p54 CA #1 p54 SAE OP #1-2 p112 ST #5 p142 SAE OP #1 p166 (continued)

Standards / Objectives / Indicators	Textbook Pages
	CA #1 p237 CA #1 p321 CA #3 p417 SAE OP #1 p568 ST #5 p630 SAE OP #1 p663 CA #2 p712 SAE OP #1 p741 SAE OP #1 p798 SAE OP #1 p856 CA #2 p880 SAE OP #1 p880 SAE OP #1907 Many of the activities in the end of each chapter cover internships/placements and job shadowing.
STANDARD 4 Students will explain soil science concepts	
Objective 1 Explain the meaning and importance of soil.	CH 11 Soils and Media 292-321
1. Explain the importance of soil as a life-supporting layer.	CH 11 Soils and Media 292-321
2. Describe the agricultural and the nonagricultural uses of soil.	CH 11 Soils and Media 292-321
Objective 2 Describe basic physical, biological, and chemical properties of soil and soilless media.	Physical Properties of Soil 296-302 Biological Properties of Soil 302-303 Chemical Properties of Soil 303-307 Soilless Media 307-310 Mulch 310- 313
1. Explain soil components.	Soil Formation 295-296
2. Describe the physical characteristics of soil and soilless media.	Physical Properties of Soil 296-302 Soilless Media 307-310 TC #1 320 ST #1-5 320 CA #1-2 321
3. Describe the biological activity within soil and soilless media.	Biological Properties of Soil 302-303
4. Describe the chemical properties of soil and soilless media.	Soilless Media 307-310
5. Explain the characteristics of water movement in soil and soilless media	Soil Water 300-302 Hands-On Horticulture: Water Movement through Soil 301 TC #1 p513

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Objective 3 Explain soil fertility.	Soil and Fertility 605-606
1. Describe the meaning and importance of soil fertility.	Chemical Properties of Soil 303-307 STEM Connection: Mulch and Soil Nutrition 311 ST #3 347
2. Explain the role of organic matter, soil depth, surface slope, soil organisms, and nutrient balance in soil productivity.	What is Soil? 295 Parent Material 296 Horizons (depth of soil) 296 Managing Soil Structure 299 Biological Properties of Soil 302-303 Soil Color 302 Organic Mulches 312-313 Slope 605
STANDARD 5 Students will describe plant anatomy and physiology concepts	
Objective 1 Explain plant classification.	CH 7 Plant Taxonomy 178-211
1. Explain systems used to classify plants.	A System of Botanical Classification 181-189 Plant Keys 189
2. Compare and contrast the hierarchical classification of agricultural plants.	CH 7 Plant Taxonomy 178-211
3. Classify plants according to life cycles, plant use, and status as monocotyledons or dicotyledons.	Class 185 Bedding Plants (annuals) 508 Perennial Plants 509 Monocots and Dicots 230-231
Objective 2 Explain the structures of plant cells and important cell processes.	CH 8 Plant Biology 212-237
1. Describe the structures of a typical plant cell and their functions.	Plant Cells 215-218
2. Compare and contrast mitosis and meiosis.	Mitosis and Cytokinesis 250-251 Meiosis 252
Objective 3 Describe the anatomical features of a plant and their functions.	CH 8 Plant Biology 212-237 Plant Parts and Their Functions 222-231
1. Describe the structures of a seed, the types of seeds, and the function of seeds.	Seeds 230-231 Main Parts of a Seed 231 CH 13 Seed Propagation 350-375
2. Describe the components of a root, the types of roots, and the functions of roots.	Roots 222 ST #1 p290 ST #3 p347
3. Describe the structures of a stem, the types of stems, and the functions of stems.	Stems 223-225
4. Describe the structures of a leaf, the types of leaves, and the functions of leaves.	Leaves 225-227

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5. Describe the major parts of a flower, their functions, and the types of flowers and flower forms.	Flowers 227-229
6. Describe the structures of fruit, the types of fruit, and the purpose of fruit.	Fruits 229-230
Objective 4 Determine the influence of environmental factors on plant growth.	TC #2 p111 CH 9 Plant Growth and Development 238-263 TC #2 p261 CH 10 Environmental Conditions for Growth 264-291 ST #1 p290
1. Describe the functions of water in plant growth.	Transpiration 245-248 Water Uptake and Nutrient Access 247 Movement of Solutes 248-249
2. Explain plant responses to a shortage or excess of water.	Water Uptake and Nutrient Access 247
3. Describe efficient use of water in plant production.	Water 248 Movement of Solutes 248-249 SAE OP #4 p262 SAE OP #3 p291 ST #2 p374 TC #2 p486 CA #1 p514 TC #2 p540 SAE OP #6 p663 ST #2 p712
4. Explain the qualities of light that affect plant growth, including color, intensity, and duration.	Light-Dependent Reaction 242-243 Light-Independent Reaction 243-244 Crassulacean Acid Metabolism (CAM) and C4 Plants 243
5. Explain plant responses to light.	Photosynthesis 240-244 ST #1 p261 ST #2 p290
6. Describe the effects of temperature on plant growth.	Temperature 247-248
7. Describe plant responses to temperature extremes.	Temperature 247-248 TC #2 p289
8. Describe the effect of diseases and insects on plant growth.	CH 29 Integrated Pest Management 774-801 CH 31 Disease Management 830-861
Objective 5 Explain plant physiology concepts and energy conversion in plants.	CH 9 Plant Growth and Development 238-

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1. Explain the basic process of photosynthesis and its importance to life on Earth.	Photosynthesis 240-244 ST #1 p84
2. Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.	Photosynthesis 240-244 ST #1 p84
3. Explain cellular respiration and its importance to plant life.	Respiration 244-245 ST #1 p84 TC #1 p261 ST #1-2 p261
4. Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration.	ST #1 p84 Respiration 244-245 ST #2 (transpiration) 261
Objective 6 Explain plant reproduction.	Reproduction 249-253 CH 15 Layering and Division 396-417 CH 16 Grafting and Budding 418-441 CH 17 Tissue Culture: Micropropagation 442-459
1. Compare and contrast sexual and asexual reproduction.	Mitosis and Cytokinesis 250-251 Sexual Reproduction 251-252 Meiosis 252
2. Explain pollination, cross-pollination, and self-pollination of flowering plants.	Fertilization 252 Plant Breeding Principles 253-255 Pollination (fruit) 609 Commercial Pollination 818-819
3. Diagram the process of plant fertilization.	Fertilization 252
4. Describe the process of seed germination.	Seed Germination 354-356
5. Explain the conditions required for seed germination.	Seed Germination 354-356
6. Explain the importance of seed viability and vigor.	STEM Connection: Seed Viability Experiment 867
7. Describe optimal conditions for asexual propagation.	Biological Principles of Leaf and Stem Propagation 378-380
8. Demonstrate techniques used to propagate plants by cuttings, division, separation, and layering.	CH 14 STEM and Leaf Propagation 376-395 CH 15 Layering and Division 396-417 TC #1 p394 ST #2 p394 CA #1 p395 SAE OP #4 p417
9. Describe grafting techniques.	CH 16 Grafting and Budding 418-441 ST #2 p440

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Objective 7 Explain the management of plant growth and development.	CH 9 Plant Growth and Development 238-263 CH 10 Environmental Conditions for Growth 264-291
1. Describe the role of the apical meristem in plant growth.	Meristem 219
2. Identify plant hormones and explain their functions.	Nodes, Internodes, and Buds 223 Chemical Dormancy 357 Warm temperature pretreatment 382 Plant Growth Regulators 389-390 Layering in Propagation (3rd paragraph) 399
3. Explain plant tropisms.	Phototropism 271
4. Differentiate between synthetic growth regulators and plant hormones.	Plant Growth Regulators 389-390 Layering in Propagation (3rd paragraph) 399
5. Describe the benefits of using plant growth regulators.	Plant Growth Regulators 389-390 Growth Media 448 Medium Composition 450 DIF 496 Plant Growth Regulators 500
STANDARD 6 Students will explain principles of horticulture	
Objective 1 Explain plant management for food production.	CH 22 Vegetable Production 570-599 CH 23 Fruit and Nut Production 600-631
1. Plan and prepare a vegetable/herb garden.	Plant Material 589 Figure 22-19 Garden Plan
2. Describe the important techniques in producing tree fruits and small fruits.	CH 23 Fruit and Nut Production 600-631
3. Describe the elements of edible landscaping and limited space food production, including roof top, container, and raised-bed gardening.	CH 20 Alternative Growing Methods 516-541
4. Explain the techniques involved in producing small grain and oil crops.	Production Methods 586-588
5. Discuss the importance of hay and forage production to the overall food system.	
Objective 2 Explain plant management for ornamental horticulture production.	CH 25 Floral Design 664-689 CH 26 Interior Plantscaping 690-713
1. Describe lawn establishment and care.	CH 27 Landscape Installation and Maintenance 714-741 CH 28 Turfgrass Management 742-773

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2. Plan and prepare a flower garden.	CH 24 Landscape Design 632-663 Elements and Principles of Landscape Design 638-644 Tools of Landscape Design 644-647 Mulch 650-651 SAE OP #4 p663
3. Develop a home landscape plan.	Landscape Design Plans 716-718 STEM Connection: Rendering a Landscape Plan 718 TC #1-2 p739 ST #4 p740
4. Describe the important techniques of landscape maintenance.	Landscape Maintenance 726-732 Watering 727-728 Fertilizing 728-730 Pruning 730-731 Edging 731-732 Mulching 732 STEM Connection: Calculating Mulch 651
5. Describe the elements of growing plants indoors.	CH 18 Greenhouse Operation and Maintenance 460-487 CH 19 Greenhouse Production 488-515 CH 26 Interior Plantscaping 690-713 TC #2 p712 ST #2, 3, 4 p712 SAE OP #2 p713