Goodheart-Willcox Publisher
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Utah State Office of Education – Core Alignment Correlation to *Principles of Agriculture, Food, and Natural Resources* ©2017	
Goodheart-Willcox Publisher	
ISBN: 978-1-63126-235-7 Media: Printed Textbook Author(s): Rayfield, Smith, Park, Croom Copyright: 2017 Review Date: March 2016 Core Subject Area: CTE Agricultural Education Course: Agricultural Science I (30010000050)	
STANDARD / OBJECTIVE	**PAGES / DESIGNATED SECTIONS / URLs**
STANDARD 1 **Students will explain the role of FFA in agricultural education.**	
Objective 1: Discuss the history and organization of FFA as it relates to the complete program of agricultural education. a. Explain the interrelationship of classroom and laboratory instruction, supervised agricultural experience, and FFA. b. Describe how, when, and why FFA was organized. c. Identify key FFA historical events. d. Identify the mission and strategies, colors, motto, emblem and parts of the emblem, and organizational structure of FFA. e. Recite and explain the meaning of the FFA Creed. f. Discuss the meaning and purpose of a program of activities and its committee structure. g. List FFA chapter officers, and discuss the role of each.	Lesson 2.1, 60–61 a. Lesson 3.1, 98–116
Objective 2: Identify opportunities in FFA a. Describe FFA opportunities that develop leadership skills, personal growth, and career success. b. Summarize major state and national activities available to FFA members.	a. 60 (scholarships); 60–61 (leadership opportunities); 67 (speaking events); 69 (presenting); 100 (activities); 110 (awards and recognition) ; 111 (proficiency awards); 86 (parliamentary procedure CDE); 129 (exploratory SAEs); 137 (job interview CDE); 405 (marketing CDE); 413 (farm business management CDE); 475 (food science CDE); 532 (cattle evaluation/management); 543 (horse evaluation CDE); 579 (candling eggs); 585 (poultry evaluation CDE); 608 (livestock CDE); 678 (veterinary science CDE); 697

	(aquaculture proficiency award); 763 (agronomy CDE); 819 (floriculture CDE); 827 (nursery/landscape CDE) b. 216 (local/state/national agriscience fairs); 60–61 (leadership opportunities); 67 (speaking events); 69 (presenting); 100 (activities); 110 (awards and recognition) ; 111 (proficiency awards); 86 (parliamentary procedure CDE); 129 (exploratory SAEs); 137 (job interview CDE); 405 (marketing CDE); 413 (farm business management CDE); 475 (food science CDE); 532 (cattle evaluation/management); 543 (horse evaluation CDE); 579 (candling eggs); 585 (poultry evaluation CDE); 608 (livestock CDE); 678 (veterinary science CDE); 697 (aquaculture proficiency award); 763 (agronomy CDE); 819 (floriculture CDE); 827 (nursery/landscape CDE)
Objective 3: Describe FFA degrees, awards, and career development events (CDEs). a. List and explain the FFA degree areas. b. Identify FFA proficiency awards. c. List and discuss various team and individual CDEs.	a. b. 110; 111 c. 61 (Student Organizations); 86 (Parliamentary Procedure CDE); 137 (job interview CDE); 405 (marketing CDE); 413 (farm business management CDE); 475 (food science CDE); 532 (cattle evaluation/management); 543 (horse evaluation CDE); 579 (candling eggs); 585 (poultry evaluation CDE); 608 (livestock CDE); 678 (veterinary science CDE); 697 (aquaculture proficiency award); 763 (agronomy CDE); 819 (floriculture CDE); 827 (nursery/landscape CDE)
STANDARD 2 **Students will explain the role of supervised agricultural experience (SAE) programs in agricultural education.**	
Objective 1: Examine the responsibilities and benefits associated with an SAE a. Explain the meaning and benefits of supervised agricultural experience. b. Explain the characteristics of an effective SAE program and the responsibilities of those involved.	Lesson 3.1, 98–116 a. Lesson 3.1, 100–103 b. Lesson 3.1, 99–114
Objective 2: Determine the types of SAE programs. a. Compare entrepreneurship SAEs and placement SAEs. b. Describe research/experimentation SAEs.	101–103 a. 102–103 b. 101–102 c. 101–102

c. Describe exploratory SAEs.	
Objective 3: Plan an SAE program. a. Identify the steps in planning an SAE program. b. Describe the function of a business/training plan and/or agreement in an SAE program. c. Develop a short-range plan and a long-range plan for an SAE program. d. Relate classroom and laboratory instruction to an SAE program.	103–113 a. 103–113 b. 108–113, 403–415, 408 c. 108–109 d. 99–103
Objective 4: Maintain and use SAE records. a. Explain the importance of keeping records on an SAE program. b. Explain how SAE records are organized. c. Follow approved procedures to make entries in SAE records.	110–113 a. 110–111 b. 110–114 c. 110–114
STANDARD 3 **Students will describe the relationship of agricultural science to the sciences and the scientific method.**	
Objective 1: Describe how science is integral to agriculture. a. Describe how life science, including botany and zoology, is integral to agriculture. b. Describe how physical science, including earth science, chemistry, and physics, is integral to agriculture. c. Describe how mathematics, including calculation, measurement, and statistics, is integral to agriculture. d. Describe how the social sciences, including economics, geography, sociology, and psychology, is integral to agriculture.	Chapter 5, 208–255 (agriculture science) a. 224–225 b. 222–224 c. 226–227, 419–435 d. 227–229
Objective 2: Apply the scientific method in solving agricultural problems. a. Define the scientific method, and explain why it is used. b. List and explain the steps of the scientific method, including problem identification, information gathering, hypothesis formation, experimentation, and conclusion. c. Maintain laboratory logs, including detailed and precise records of events and observations. d. Use the scientific method to investigate a problem appropriate for entering the National FFA Agriscience Fair and Awards Program. e. Explain the general guidelines for preparing a research	211–217 a. 211 b. 211–217 c. 215–217 d. 211–217, 216 e. 217

report according to the National FFA Agriscience Fair and Awards Program.	
Objective 3: Explore the role of research, development, and technology in the agricultural industry. a. Explain the meaning and importance of research and development. b. Identify major providers of agricultural research, such as the USDA's Agricultural Research Service and the Utah Agricultural Experiment Station, and review examples of their research. c. Identify major areas of research in agriculture. d. Define biotechnology, and explore its impact on agriculture. e. Describe current applications of biotechnology in agriculture. f. Describe benefits and risks associated with biotechnology. g. Identify career opportunities in agricultural biotechnology. h. Determine the role of science and technology in agricultural production and processing. i. Describe the application of precision technologies in agriculture.	119, 221–231 a. 210 b. 177 (training programs); 184 (farm safety); 224 (chemical regulation); 241 (FDA); 246 (USDA Foreign Agricultural Service); 326 (EPA); 376 (NFPA); 470–472 (food safety); 988 (water management); 1018–1019 (wildlife management) c. 221–229 d. 29, 232–249 e. 232–249 f. 246–247 g. 119–120 h. Chapter 5, 208–255; 278 i. 29, 280–284, 884
Objective 4: Apply mathematics skills used in the agricultural industry. a. Convert standard and metric measurements. b. Determine length, area, and volume measurements. c. Calculate interest rates.	400–439 a. 420–424 b. 428–430 c. 411
Objective 5: Describe safety skills needed in the agricultural industry. a. Explain where accidents occur and identify agencies associated with workplace safety. b. Explain why accidents occur and how to prevent them. c. Demonstrate personal and laboratory safety, including correct use of personal protective equipment (PPE) and proper disposal of wastes.	Chapter 4, 144–207 a. 158–159; 167–171; 176–177 (behavior/tool usage); 179–181 (machinery); 181–185 (electrical); 185–186 (weather); 186–187 (livestock); 187–188 (ATVs); 188–190 (manure pits); 190–192 (silo); 192–195 (grain bin/machinery); 196–197 (pesticide) b. 158–159 (shops/labs); 167–171 (electrical); 176–177 (behavior/tool usage); 179–181 (machinery); 181–185 (electrical); 185–186 (weather); 186–187 (livestock); 187–188 (ATVs); 188–190 (manure pits); 190–192 (silo); 192–195 (grain bin/machinery); 196–197 (pesticide) c. 153 (best practices); 159–163 (PPE); 167 (hazardous materials); 177–178 (PPE); 178 (hazardous materials); 188–190 (manure pits); 196 (container disposal); 263, 268, 271, 689, 951 (waste management); 983 (livestock waste)

STANDARD 4 Students will explain basic principles of agricultural science.	
Objective 1: Examine basic soil science principles. a. Explain the components of soil. b. Investigate soil texture and structure. c. Explain soil profile. d. Explain what soil color indicates. e. Examine moisture-holding capacity and the characteristics of soil water. f. Explain soil pH. g. Describe the meaning and importance of soil fertility. h. Investigate soil degradation. i. Describe soil erosion and management practices. j. Identify careers in soil science and determine educational requirements, working conditions, and earning potential for those careers.	Lesson 15.2 929–945 a. 936–940 b. 936–940 c. 929–932 d. 929–932 e. 936, 938 f. 934 (rainfall affect); 934–935 (leaching) g. 932–936 (formation); 936–940 (composition); 940–944 (enrichment) h. 920–922; 940 (enrichment/preservation); 942 (erosion); 943 (compaction); 944 (salinization) i. 942–944 j. 945
Objective 2: Investigate basic principles of the plant science industry. a. Explain plant classification and nomenclature. b. Examine plant structures and functions; c. Classify plants according to plant use; status as annual, biennial, and perennial, and status as monocotyledons or dicotyledons. d. Explain the basic process of photosynthesis and its importance to life on Earth. e. Explain cellular respiration and its importance to plant life. f. Identify careers in plant science and determine educational requirements, working conditions, and earning potential for those careers.	5; 426 (percentages) a. Lesson 13.1 736–753; 745–747 (classification) b. 738–739 (structure); 739–745 (parts); 748–742 (functions) c. 745–747 (classification) d. 748–751 e. 749–750 f. 38 (STEM careers); 212 (agricultural research experiment station director); 223 (food scientist); 240 (cell culture technician); 770 (crop consultant); 853 (ecologist); 1062 (arborists/urban forester); 1074 (forester)
Objective 3: Investigate basic principles of the animal science industry. a. Compare differences between plants and animals. b. Identify basic characteristics of animal cells, tissues, organs, and organ systems. c. Describe the skeletal, muscular, nervous, respiratory, digestive, circulatory, excretory, and reproductive systems of animals. d. Describe the basic physiological functions of animal bodily systems. e. Compare and contrast ruminant and nonruminant digestive systems. f. Compare and contrast cattle, sheep and swine breeds, uses, and products. g. Compare and contrast nutritional needs of cattle, sheep, and swine. h. Identify careers in animal science and determine educational requirements, working	Lesson 9.4 480–498 a. Lesson 9.4, 480–498; Lesson 13.1, 736–756 b. 512 (beef cattle anatomy); 532 (dairy cattle anatomy) c. 491–496 (digestion); 510 (beef cattle reproduction); 529 (dairy cattle reproduction); 540 (equine reproduction); 548–549 (equine anatomy); 549 (equine digestion); 581–582 (poultry anatomy); 582 (poultry digestion); 604 (swine reproduction); 608 (swine anatomy); 609 (swine digestion); 618 (sheep reproduction); 620–622 (sheep anatomy); 629 (goat reproduction); 631–632 (meat and dairy goat anatomy) d. 481–487 (nutrients/absorption); 491–496 (digestion) e. 491–496 (digestion); 549 (equine

conditions, and earning potential for those careers.	digestion); 609 (swine digestion) f. 508–525 (beef); 526–537 (dairy); 602–615 (swine); 616–627 (sheep) g. Lesson 9.4, 480–498 h. 38 (STEM careers); 240 (cell culture technician); 477 (FSIS veterinarian); 489 (animal nutritionist); 551 (equine chiropractor); 607 (livestock veterinarian); 1027 (wildlife biologist)
Objective 4: Explain the role of genetics in agricultural science. a. Define genetics, and discuss its importance. b. Identify and discuss the contents of a genome. c. Distinguish heredity type, including genotype and phenotype. d. Describe genetic trait expression and prediction.	232–247 a. 234–242 (plants); 242–247 (animals) b. 246, 254 c. 234–235 d. 234–235
Objective 5: Explore means of conserving natural resources. a. Identify types of natural resources. b. Describe components and processes in ecosystems. c. Determine sources of environmental pollution and describe methods for reducing pollution. d. Compare methods of waste disposal. e. Determine how to reduce agricultural pollution. f. Determine the importance and methods of natural resource conservation. g. Identify careers in natural resources and determine educational requirements, working conditions, and earning potential for those careers.	918–928 (conservation history); 940–943 (soil preservation) a. 12; Lesson 7.1, 298–319 (energy systems) b. Lesson 14.1, 840–856 c. 862 (surface water); 968 (fertilizer runoff); 970 (fecal waste); 971–972 (water); 972–974 (sources); 982–984 (water pollution control); 985 (irrigation); 1032 (human); 1034 (reducing carbon footprint) d. 196 (container); 263–264 (poultry); 264 (swine); 268 (equine); 444 (food system chain); 689 (aquaculture) 984 (livestock) e. 278–279 (technology in agriculture); 281 (GPS); 282 (telemetry); 284 (organic farming); 308 (biomass energy); 744 (hydroponics); 766, 868–869 (tillage); 852; 862, 983 (riparian zones); 871 (agricultural sources); 884–885 (today's agriculture); 941 (limiting pesticide use); 942 (tillage); 977–982 (erosion control); 982–984 (water pollution control) f. 765 (tillage); 864 (water conservation); 918–928 (history); Lesson 15.5, 977–990 (conservation practices in agriculture); Lesson 16.2, 1018–1029 (wildlife management); Lesson 16.3, 1030–1039 (stewardship of natural resources) g. 38 (STEM careers); 123–124; 155 (agricultural engineer); 317 (agricultural engineer); 713 (hunting preserve manager); 853 (ecologist); 873 (reservoir manager); 889 (meteorologist); 903 (GPS technician); 926

	(conservation service civil engineer); 945 (soil scientist); 961 (hydrologist); 973 (water quality technician); 1015 (conservation officer); 1027 (wildlife biologist); 1074 (forester)
Objective 6: Describe food science technology. a. Research the scope of the food science industry and the world food supply. b. Explain food preservation methods. c. Describe food spoilage prevention. d. Describe food safety and sanitation. e. Identify careers in food science and determine educational requirements, working conditions, and earning potential for those careers.	223 (food scientist); Chapter 9, 440—505 (importance of food) a. Chapter 9, 440–505 (importance of food) b. 444 (use of local food systems); 475 (HACCP) c. 472–474 (safety and processing continuum) d. 458 (regulations/safety); 470–472 (government agencies); 472–474 (safety and processing continuum); 475 (HACCP); 476 (emerging technology) e. 13 (production agriculturist); 38 (STEM careers);155 (agricultural engineer); 212 (agricultural research experiment station director); 223 (food scientist); 240 (cell culture technician); 477 (FSIS veterinarian); 489 (animal nutritionist); 770 (crop consultant); 783 (grain inspector); 810 (food safety inspector)
STANDARD 5 **Students will explain basic agribusiness principles and demonstrate employability skills.**	
Objective 1: Explore personal finance management. a. Investigate personal finances and goal making. b. Distinguish the pros and cons of borrowing money. c. Determine sources of credit.	Lesson 8.1, 400–418 (agricultural business principles) a. 403 (planning); 407–408 (financial plan) b. 410–412 (liabilities); 412–415 (accounting for profitability) c. 408 (capital); 410 (liabilities); 410–411 (loans)
Objective 2: Examine business structures and management. a. Describe basic principles of business management. b. Explain different types of business structures. c. Define and explain ethics in agribusiness.	a. b. c. 415 (business ethics)
Objective 3: Explain keeping and using records in agricultural occupations. a. Explain the purpose of record keeping. b. Describe net worth, cash flow, income statements, and computerized record keeping. c. Develop a budget for an agricultural enterprise.	a. 110–114 b. 411 (net worth); 412–413 (cash flow/statement); 113 (methods) c. 407 (financial plan)
Objective 4: Demonstrate communication skills needed for successful employment. a. Define communication and its components and	128–130 (preparing to be an employee) a. Lesson 2.2, 64–77 b. 65 (nonverbal); 65–69 (verbal); 69–71

processes. b. Describe effective communication techniques. c. Identify effective speaking techniques. d. Develop listening techniques. e. Organize and present a persuasive message. f. Demonstrate communication skills in appropriate situations.	(written) c. 67 (public speaking) d. 69 (listening) e. 68 (writing speeches) f. Lesson 2.2 , 64–77