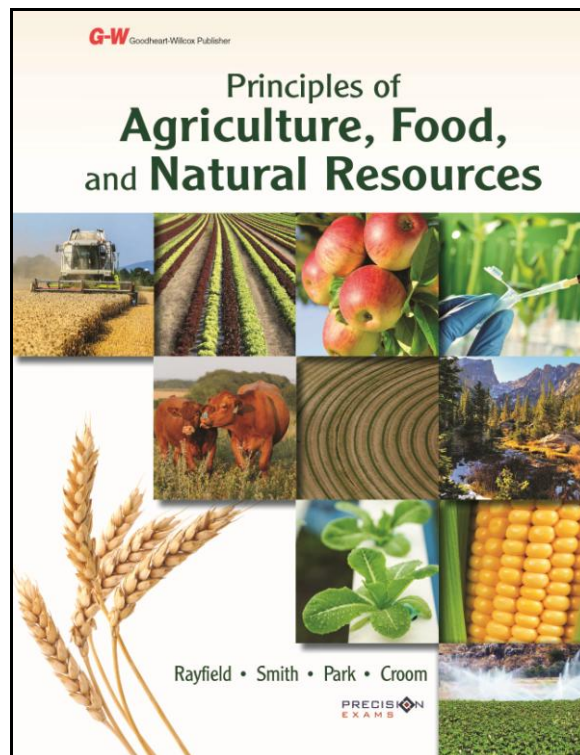


Correlation of
Principles of Agriculture, Food, and Natural Resources
Rayfield, Smith, Park, Croom
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to
Precision Exams Agricultural Science 1

Goodheart-Willcox is pleased to partner with Precision Exams by correlating *Principles of Agriculture, Food, and Natural Resources* to their Agricultural Science 1 standards. Precision Exams standards and Career Skills Exams were created in concert with industry and subject matter experts to match real-world job skills and marketplace demands. Students that pass the exam and performance portion of the exam can earn a Career Skills Certification.

The correlation chart below lists the Standards, Objectives, and Indicators for the Agricultural Science 1 exam in the left column. Corresponding content from *Principles of Agriculture, Food, and Natural Resources* 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
Standard 1: 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.	Lesson 2.1, 60–61, 99–100, 101
Indicator 1: Explain the interrelationship of classroom and laboratory instruction, supervised agricultural experience, and FFA.	Lesson 3.1, 98–116
Indicator 2: Describe how, when, and why FFA was organized.	Lesson 2.1, 60–61
Indicator 3: Identify key FFA historical events.	60, 101

Standards / Objectives / Indicators	Textbook Pages
Indicator 4: Identify the mission, strategies, colors, motto, emblem, parts of the emblem, and organizational structure of FFA.	67
Indicator 5: Recite and explain the meaning of the FFA Creed.	67
Indicator 6: Discuss the meaning and purpose of a program of activities and its committee structure.	99–100, 111, 216
Indicator 7: List FFA chapter officers and discuss the role of each.	60–61
Objective 2. Identify opportunities in FFA.	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)
Indicator 1: Describe FFA opportunities that develop leadership skills, personal growth, and career success.	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)
Indicator 2: Summarize major state and national activities available to FFA members.	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)

Standards / Objectives / Indicators	Textbook Pages
Standard 2: Explain the Role of Supervised Agricultural Experience (SAE) Programs in Agricultural Education	
Objective 1. Examine the responsibilities and benefits associated with an SAE.	Lesson 3.1, 98–116
Indicator 1: Explain the meaning and benefits of supervised agricultural experience.	Lesson 3.1, 100–103
Indicator 2: Explain the characteristics of an effective SAE program and the responsibilities of those involved.	Lesson 3.1, 99–114
Objective 2. Determine the types of SAE programs.	101–103
Indicator 1: Compare entrepreneurship SAEs and placement SAEs.	102–103
Indicator 2: Describe research/experimentation SAEs.	101–102
Indicator 3: Describe exploratory SAEs.	101–102
Objective 3. Plan an SAE program.	103–113
Indicator 1: Identify the steps in planning an SAE program.	103–113
Indicator 2: Describe the function of a business/training plan and/or agreement in an SAE program.	108–113, 403–415
Indicator 3: Develop a short-range plan and a long-range plan for an SAE program.	108–109
Indicator 4: Relate classroom and laboratory instruction to an SAE program.	99–103
Objective 4. Maintain and use SAE records.	110–113
Indicator 1: Explain the importance of keeping records on an SAE program.	110–111
Indicator 2: Explain how SAE records are organized.	110–114
Indicator 3: Follow approved procedures to make entries in SAE records.	110–114
Standard 3: Describe the Relationship of Agricultural Science to the Sciences and the Scientific Method	
Objective 1. Describe how science is integral to agriculture.	Chapter 5, 208–255 (agriculture science)
Indicator 1: Describe how life science, including botany and zoology, is integral to agriculture.	224–225
Indicator 2: Describe how physical science, including earth science, chemistry, and physics, is integral to agriculture.	222–224

Standards / Objectives / Indicators	Textbook Pages
Indicator 3: Describe how mathematics, including calculation, measurement, and statistics, is integral to agriculture.	226–227, 419–435
Indicator 4: Describe how the social sciences, including economics, geography, sociology, and psychology, is integral to agriculture.	227–229
Objective 2. Apply the scientific method in solving agricultural problems.	211–217
Indicator 1: Define the scientific method and explain why it is used.	211
Indicator 2: List and explain the steps of the scientific method, including problem identification, information gathering, hypothesis formation, experimentation, and conclusion.	211–217
Indicator 3: Maintain laboratory logs, including detailed and precise records of events and observations.	215–217
Indicator 4: Use the scientific method to investigate a problem appropriate for entering the FFA Agriscience Fair and Awards Program.	211–217
Indicator 5: Explain the general guidelines for preparing a research report.	217
Objective 3. Explore the role of research, development, and technology in the agricultural industry.	119, 221–231
Indicator 1: Explain the meaning and importance of research and development.	210
Indicator 2: Identify major providers of agricultural research, such as the USDA's Agricultural Research Service, and review examples of their research.	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)
Indicator 3: Identify major areas of research in agriculture.	221–229
Indicator 4: Define biotechnology and explore its impact on agriculture.	29, 232–249
Indicator 5: Describe current applications of biotechnology in agriculture.	232–249
Indicator 6: Describe benefits and risks associated with biotechnology.	246–247
Indicator 7: Identify career opportunities in agricultural biotechnology.	119–120

Standards / Objectives / Indicators	Textbook Pages
Indicator 8: Determine the role of science and technology in agricultural production and processing.	Chapter 5, 208–255; 278
Indicator 9: Describe the application of precision technologies in agriculture.	29, 280–284, 884
Objective 4. Apply mathematics skills used in the agricultural industry.	400–439
Indicator 1: Convert standard and metric measurements.	420–424
Indicator 2: Determine length, area, and volume measurements.	428–430
Indicator 3: Calculate interest rates.	411
Objective 5. Describe safety skills needed in the agricultural industry.	Chapter 4, 144–207
Indicator 1: Explain where accidents occur and identify agencies associated with workplace safety.	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)
Indicator 2: Explain why accidents occur and how to prevent them.	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)
Indicator 3: Demonstrate personal and laboratory safety, including correct use of personal protective equipment (PPE) and proper disposal of wastes.	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: Explain Basic Principles of Agricultural Science	
Objective 1. Examine basic soil science principles.	Lesson 15.2, 929–945
Indicator 1: Explain the components of soil.	936–940
Indicator 2: Investigate soil texture and structure.	936–940
Indicator 3: Explain soil profile.	929–932
Indicator 4: Explain what soil color indicates.	929–932
Indicator 5: Examine moisture-holding capacity and the characteristics of soil water.	936, 938
Indicator 6: Explain soil pH.	934 (rainfall affect); 934–935 (leaching)

Standards / Objectives / Indicators	Textbook Pages
Indicator 7: Describe the meaning and importance of soil fertility.	932–936 (formation); 936–940 (composition); 940–944 (enrichment)
Indicator 8: Investigate soil degradation.	920–922; 940 (enrichment/preservation); 942 (erosion); 943 (compaction); 944 (salinization)
Indicator 9: Describe soil erosion and management practices.	942–944
Indicator 10: Identify careers in soil science and determine educational requirements, working conditions, and earning potential for those careers.	945
Objective 2. Investigate basic principles of the plant science industry.	5; 426 (percentages)
Indicator 1: Explain plant classification and nomenclature.	Lesson 13.1, 736–753; 745–747 (classification)
Indicator 2: Examine plant structures and functions.	738–739 (structure); 739–745 (parts); 748–752 (functions)
Indicator 3: Classify plants according to plant use; status as annual, biennial, and perennial; and status as monocotyledons or dicotyledons.	745–747 (classification)
Indicator 4: Explain the basic process of photosynthesis and its importance to life on Earth.	748–751
Indicator 5: Explain cellular respiration and its importance to plant life.	749–750
Indicator 6: Identify careers in plant science and determine educational requirements, working conditions, and earning potential for those careers.	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.	Lesson 9.4, 480–498
Indicator 1: Compare differences between plants and animals.	Lesson 9.4, 480–498; Lesson 13.1, 736–756
Indicator 2: Identify basic characteristics of animal cells, tissues, organs, and organ systems.	512 (beef cattle anatomy); 532 (dairy cattle anatomy)
Indicator 3: Describe the skeletal, muscular, nervous, respiratory, digestive, circulatory, excretory, and reproductive systems of animals.	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);

Standards / Objectives / Indicators	Textbook Pages
Indicator 4: Describe the basic physiological functions of animal bodily systems.	481–487 (nutrients/absorption); 491–496 (digestion)
Indicator 5: Compare and contrast ruminant and nonruminant digestive systems.	491–496 (digestion); 549 (equine digestion); 609 (swine digestion)
Indicator 6: Compare and contrast cattle, sheep, and swine breeds, uses, and products.	508–525 (beef); 526–537 (dairy); 602–615 (swine); 616–627 (sheep)
Indicator 7: Compare and contrast nutritional needs of cattle, sheep, and swine.	Lesson 9.4, 480–498
Indicator 8: Identify careers in animal science and determine educational requirements, working conditions, and earning potential for those careers.	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.	232–247
Indicator 1: Define genetics and discuss its importance.	234–242 (plants) 242–247 (animals)
Indicator 2: Identify and discuss the contents of a genome.	246, 254
Indicator 3: Distinguish heredity type, including genotype and phenotype.	234–235
Indicator 4: Describe genetic trait expression and prediction.	234–235
Objective 5. Explore means of conserving natural resources.	918–928 (conservation history); 940–943 (soil preservation)
Indicator 1: Identify types of natural resources.	12; Lesson 7.1, 298–319 (energy systems)
Indicator 2: Describe components and processes in ecosystems.	Lesson 14.1, 840–856
Indicator 3: Determine sources of environmental pollution and describe methods for reducing pollution.	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)
Indicator 4: Compare methods of waste disposal.	196 (container); 263–264 (poultry); 264 (swine); 268 (equine); 444 (food system chain); 689 (aquaculture) 984 (livestock)
Indicator 5: Determine how to reduce agricultural pollution.	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)

Standards / Objectives / Indicators	Textbook Pages
Indicator 6: Determine the importance and methods of natural resource conservation.	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)
Indicator 7: Identify careers in natural resources and determine educational requirements, working conditions, and earning potential for those careers.	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.	223 (food scientist); Chapter 9, 440–505 (importance of food)
Indicator 1: Research the scope of the food science industry and the world food supply.	Chapter 9, 440–505 (importance of food)
Indicator 2: Explain food preservation methods.	444 (use of local food systems); 475 (HACCP)
Indicator 3: Describe food spoilage prevention.	472–474 (safety and processing continuum)
Indicator 4: Describe food safety and sanitation.	458 (regulations/safety); 470–472 (government agencies); 472–474 (safety and processing continuum); 475 (HACCP); 476 (emerging technology)
Indicator 5: Identify careers in food science and determine educational requirements, working conditions, and earning potential for those careers.	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: Explain Basic Agribusiness Principles and Demonstrate Employability Skills	
Objective 1. Explore personal finance management.	Lesson 8.1, 400–418 (agricultural business principles)
Indicator 1: Investigate personal finances and goal making.	403 (planning); 407–408 (financial plan)
Indicator 2: Distinguish the pros and cons of borrowing money.	410–412 (liabilities); 412–415 (accounting for profitability)
Indicator 3: Determine sources of credit.	408 (capital); 410 (liabilities); 410–411 (loans)
Objective 2. Examine business structures and management.	402–415
Indicator 1: Describe basic principles of business management.	402–415
Indicator 2: Explain different types of business structures.	404–406

Standards / Objectives / Indicators	Textbook Pages
Indicator 3: Define and explain ethics in agribusiness.	415 (business ethics)
Objective 3. Explain keeping and using records in agricultural occupations.	110–114, 407, 411–413
Indicator 1: Explain the purpose of record keeping.	110–114
Indicator 2: Describe net worth, cash flow, income statements, and computerized record keeping.	411 (net worth); 412–413 (cash flow/statement); 113 (methods)
Indicator 3: Develop a budget for an agricultural enterprise.	407 (financial plan)
Objective 4. Demonstrate communication skills needed for successful employment.	128–130 (preparing to be an employee)
Indicator 1: Define communication and its components and processes.	Lesson 2.2, 64–77
Indicator 2: Describe effective communication techniques.	65 (nonverbal); 65–69 (verbal); 69–71 (written)
Indicator 3: Identify effective speaking techniques.	67 (public speaking)
Indicator 4: Develop listening techniques.	69 (listening)
Indicator 5: Organize and present a persuasive message.	68 (writing speeches)
Indicator 6: Demonstrate communication skills in appropriate situations.	Lesson 2.2 , 64–77