

# Instructional Framework

Agriscience  
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<b>Domain 1: Science of the Agricultural Industry</b>	
<b>Instructional Time: 35-45%</b>	
<b>STANDARD 1.0 EXAMINE THE NATURE, SCOPE, AND ROLE OF AGRICULTURE IN THE SOCIETY AND THE ECONOMY</b>	
1.1 Investigate the impact of the agricultural industry on population, food, energy, and environment	<ul style="list-style-type: none"> <li>• Production impact</li> </ul>
1.2 Investigate the economic importance of products obtained from agriculture (i.e., animals, plants, technology, mechanics, etc.)	<ul style="list-style-type: none"> <li>• Commodity</li> <li>• Dollars generated by Arizona Agriculture Industry</li> </ul>
1.3 Examine how a stable agricultural sector supports a nation of food security	<ul style="list-style-type: none"> <li>• Agriculture sustainability</li> </ul>
1.4 Differentiate between agricultural imports and exports	<ul style="list-style-type: none"> <li>• Import</li> <li>• Export</li> </ul>
1.5 Examine the benefit of earning foreign exchange through the export of agricultural products	<ul style="list-style-type: none"> <li>• Gross Domestic Product (GDP)</li> </ul>
1.6 Investigate how the agriculture sector provides employment opportunities to the labor force	<ul style="list-style-type: none"> <li>• Career Exploration</li> </ul>
<b>STANDARD 2.0 EXAMINE THE IMPACT OF TRENDS, TECHNOLOGIES, AND POLICIES ON AGRICULTURE</b>	
2.1 Identify the major milestones and technological advancements on agriculture and the impact to society (e.g., advances in mechanization, quality seed and selective breeding, improved resource management, higher quantity of food)	<ul style="list-style-type: none"> <li>• Evolution of agriculture</li> <li>• Advances in mechanization</li> <li>• Quality seed and selective breeding</li> <li>• Improved resource management</li> <li>• Higher quantity of food</li> </ul>
2.2 Describe the effects of genetic modification on agricultural production	<ul style="list-style-type: none"> <li>• Genetically Modified Organisms (GMOs)</li> </ul>
2.3 Describe the effects of current farming methods on water resources, erosion, and soil fertility	<ul style="list-style-type: none"> <li>• Efficiency of water usage</li> <li>• Sustainability</li> </ul>
2.4 Explain the effects of pesticides and fertilizers on water and the environment	<ul style="list-style-type: none"> <li>• Overuse of products</li> </ul>

2.5 Explain how legislation affects agricultural production (i.e., environmental, workforce, marketing, trade, animal welfare, biosecurity, taxes, water, etc.)	<ul style="list-style-type: none"> <li>• Laws and economical changes</li> <li>• Agricultural Issues</li> </ul>
2.6 Analyze the impact of biotechnology on production, processing, storage, and preparation of food, fiber, and pharmaceuticals	<ul style="list-style-type: none"> <li>• Food and Drug Administration (FDA) regulations</li> </ul>
2.7 Use scientific evidence to investigate controversial topics and make educated decisions (i.e., environmental issues, climate change, genetic engineering, soil degradation, etc.)	<ul style="list-style-type: none"> <li>• Agriculture Issues</li> <li>• Pros and Cons</li> </ul>
2.8 Investigate the use of data to solve problems in agricultural systems (i.e., geographic, economic, demographic, etc.)	<ul style="list-style-type: none"> <li>• Urbanization: Rural vs Urban</li> </ul>
<b>STANDARD 3.0 EXAMINE THE USE OF SCIENTIFIC PROCESSES USED IN AGRICULTURE</b>	
3.1 Identify research methods used in agriculture	<ul style="list-style-type: none"> <li>• Basic method and applied methods</li> </ul>
3.2 Describe and demonstrate the scientific process	<ul style="list-style-type: none"> <li>• Steps to scientific process</li> </ul>
3.3 Formulate predictions, questions, and hypotheses	<ul style="list-style-type: none"> <li>• Predictions, questions, and hypotheses</li> </ul>
3.4 Evaluate appropriate resources for research	<ul style="list-style-type: none"> <li>• Valid resources for research</li> <li>• Literature Review</li> </ul>
3.5 Demonstrate safe practices in the laboratory, classroom, and work situations	<ul style="list-style-type: none"> <li>• Lab Safety</li> <li>• Safety exam/survey</li> </ul>
3.6 Design and conduct scientific investigations	<ul style="list-style-type: none"> <li>• Procedures, materials, methods</li> </ul>
3.7 Record observations, notes, sketches, questions, and ideas during an investigation	<ul style="list-style-type: none"> <li>• Methods to collect data (notebook)</li> <li>• Results</li> </ul>
3.8 Generate data tables, charts, and graphs based on collected data	<ul style="list-style-type: none"> <li>• Methods to display data</li> <li>• Results</li> </ul>

3.9 Analyze data, communicate results, conclusions, and propose further investigations	<ul style="list-style-type: none"> <li>• Identifying trend</li> <li>• Conclusion of experiments</li> <li>• Reflection on conclusion</li> </ul>
<b>STANDARD 4.0 EXAMINE THE RELATIONSHIP OF THE ENVIRONMENT TO AGRICULTURE PRODUCTION AND SUSTAINABILITY</b>	
4.1 Identify agricultural products that can be converted to alternative energy sources	<ul style="list-style-type: none"> <li>• Green Algae</li> <li>• Corn/Soy for Ethanol</li> </ul>
4.2 Analyze the use of renewable energy sources in agriculture (i.e., wind, solar, biofuels etc.)	<ul style="list-style-type: none"> <li>• Renewable energy</li> </ul>
4.3 Compare and contrast production practices with regard to efficiency, sustainability, and economic viability (i.e., organic, naturally-raised systems, conventional agricultural production, etc.)	<ul style="list-style-type: none"> <li>• Pros and Cons of organic, naturally-raised, and conventional production</li> </ul>
4.4 Investigate how alternative production systems affect production and environment (i.e., aquaculture, vertical farming, GPS plotting, seed spacing, etc.)	<ul style="list-style-type: none"> <li>• Effects of aquaculture, vertical farming, GPS plotting, seed spacing</li> </ul>
4.5 Identify municipal, industrial, and agricultural sources and uses of water	<ul style="list-style-type: none"> <li>• Municipal sources of water</li> <li>• Industrial sources of water</li> <li>• Agriculture sources of water</li> </ul>
4.6 Evaluate how agriculture manages water use, waste water systems, and water recycling opportunities	<ul style="list-style-type: none"> <li>• Use and management of water in agriculture</li> </ul>
4.7 Analyze environmental factors associated with animal and plant production including sanitation and economics	<ul style="list-style-type: none"> <li>• Factors of sanitation</li> <li>• Pollution</li> </ul>
4.8 Describe the effect of agriculture on the web cycle	<ul style="list-style-type: none"> <li>• Food Web</li> </ul>
<b>STANDARD 6.0 EXAMINE CELL BIOLOGY, STRUCTURES, AND PROCESSES</b>	
6.1 Differentiate among cells, organelles, tissues, and organs	<ul style="list-style-type: none"> <li>• Plant vs Animal Cells</li> <li>• Levels of organization: Smallest to Largest</li> <li>•</li> </ul>

6.2 Describe the structure and function of DNA	<ul style="list-style-type: none"> <li>• Double Helix</li> <li>• Heredity</li> <li>• RNA</li> </ul>
6.3 Describe the process of creating proteins from DNA	<ul style="list-style-type: none"> <li>• Transcription</li> <li>• Translation</li> <li>• Replication</li> </ul>
6.4 Describe cellular processes (i.e., osmosis, mitosis, phagocytosis, meiosis, diffusion, etc.)	<ul style="list-style-type: none"> <li>• Osmosis</li> <li>• Mitosis</li> <li>• Phagocytosis</li> <li>• Meiosis</li> <li>• Diffusion</li> </ul>
6.5 Examine the molecular basis of heredity and resulting genetic diversity	<ul style="list-style-type: none"> <li>• Punnett Squares</li> <li>• Dominance</li> <li>• Recessive</li> <li>• Sex-linked</li> </ul>
6.6 Define the essential macromolecules of life science (i.e., carbohydrates, proteins, lipids, nucleic acids, etc.)	<ul style="list-style-type: none"> <li>• Essential Nutrients</li> </ul>
<b>STANDARD 12.0 EXAMINE FOOD SAFETY AND PROCESSING PRACTICES</b>	
12.1 Investigate government agencies that impact agriculture and food production	<ul style="list-style-type: none"> <li>• Food and Drug Administration (FDA)</li> <li>• Environmental Protection Agency (EPA)</li> <li>• United States Dept. of Agriculture (USDA)</li> <li>• Animal Plant Health Inspection Service (APHIS)</li> <li>• Dept. of Homeland Security</li> <li>• Center for Disease Control (CDC)</li> </ul>
12.2 Analyze food product labels	<ul style="list-style-type: none"> <li>• Parts of a food label</li> </ul>
12.3 Evaluate food processing best practices (i.e., HACCP, quality assurance, food safety standards, etc.)	<ul style="list-style-type: none"> <li>• Hazard Analysis and Critical Control Points (HACCP)</li> <li>• Food Safety Standards</li> </ul>
12.4 Develop a plan to prevent foodborne illness in agricultural products	<ul style="list-style-type: none"> <li>• Factors that cause foodborne illnesses</li> <li>• Steps to prevent</li> </ul>

**STANDARD 16.0 EXAMINE TECHNOLOGY TOOLS AND SYSTEMS USED TO ACCESS, MANAGE, INTEGRATE, AND CREATE INFORMATION AND SOLVE PROBLEMS**

16.1 Use industry-relevant software and internet applications	<ul style="list-style-type: none"> <li>• Microsoft Office Products</li> <li>• Google Docs</li> </ul>
16.2 Use collaborative and virtual meeting software	<ul style="list-style-type: none"> <li>• Zoom</li> <li>• Skype</li> <li>• Facetime</li> <li>• Discussion Boards</li> </ul>
16.3 Analyze the benefits and limitations of emerging technology such as geospatial, online mapping systems, drones, and robotics	<ul style="list-style-type: none"> <li>• Accuracy and efficiency of emerging technology</li> </ul>
16.4 Explain the benefits of computer-based and mobile application equipment	<ul style="list-style-type: none"> <li>• Pros and Cons of Computer-based and mobile equipment</li> </ul>
16.5 Apply computer and other technologies to solve problems and increase efficiency [i.e., LabQuest, programmable logic controller (PLC), Geospatial Information System (GIS), Computer numeric control (CNC), Unmanned aircraft system (UAS), etc.]	<ul style="list-style-type: none"> <li>• Vernier LabQuest</li> <li>• Programmable logic controller (PLC)</li> <li>• Geospatial Information System (GIS)</li> <li>• Computer numeric control (CNC)</li> <li>• Unmanned aircraft system (UAS)</li> </ul>

**Domain 2: Plant & Animal Science**

**Instructional Time: 35-45%**

**STANDARD 5.0 EXAMINE SOIL MANAGEMENT FOR PLANT AND ANIMAL PRODUCTION**

5.1 Describe formation, properties, texture, structure, and composition of soil	<ul style="list-style-type: none"> <li>• Texture (sand, silt, clay)</li> <li>• Soil Profile</li> <li>• Horizons</li> </ul>
5.2 Examine the relationship among soil characteristics, microflora, and environmental conditions	<ul style="list-style-type: none"> <li>• Physical characteristics of soil</li> </ul>
5.3 Analyze methods to control soil erosion	<ul style="list-style-type: none"> <li>• Methods to control erosion</li> </ul>
5.4 Analyze slope, erosion, and water movement in determining land capability,	<ul style="list-style-type: none"> <li>• Land use factors</li> </ul>

land use, and agricultural production	
5.5 Formulate appropriate soil management practices on various sites	<ul style="list-style-type: none"> <li>• Soil Management Practices</li> </ul>
<b>STANDARD 7.0 ANALYZE PLANT SCIENCE PRINCIPLES</b>	
7.1 Describe plant anatomy and the functions of plant structures (e.g., root, stem, leaf, flower)	<ul style="list-style-type: none"> <li>• Root</li> <li>• Stem</li> <li>• Leaf</li> <li>• Flower</li> </ul>
7.2 Classify plants according to taxonomic systems, use, structure, and life span	<ul style="list-style-type: none"> <li>• Taxonomy, Classification</li> <li>• Annual, Perennial, Biannual</li> <li>• Monocot vs Dicot</li> <li>• Agronomic, Ornamental, Horticultural</li> </ul>
7.3 Describe basic factors in plant growth (e.g., light, water, climate, temperature, nutrients)	<ul style="list-style-type: none"> <li>• Light</li> <li>• Water</li> <li>• Climate</li> <li>• Temperature</li> <li>• Nutrients</li> </ul>
7.4 Apply knowledge of plant physiology and energy conversion to plant systems (e.g., photosynthesis, respiration, transpiration)	<ul style="list-style-type: none"> <li>• Photosynthesis</li> <li>• Respiration</li> <li>• Transpiration</li> </ul>
7.5 Describe plant life cycle stages (i.e., germination, root growth, pollination, fruit development, etc.)	<ul style="list-style-type: none"> <li>• Germination</li> <li>• Root Growth</li> <li>• Pollination</li> <li>• Fruit Development</li> </ul>
7.6 Demonstrate plant germination, growth, and development	<ul style="list-style-type: none"> <li>• Demonstrate plant growth</li> </ul>
7.7 Investigate changes in growing conditions and the impact on plant growth and development (i.e., light, gravity, touch, water, heat, etc.)	<ul style="list-style-type: none"> <li>• Factors of plant growth</li> <li>• Experimentation</li> </ul>
<b>STANDARD 8.0 DEMONSTRATE CONCEPTS OF PLANT MANAGEMENT</b>	
8.1 Analyze the nutritional needs of plants	<ul style="list-style-type: none"> <li>• Nitrogen, Phosphorus, Potassium (N-P-K)</li> <li>• Macronutrients</li> </ul>

	<ul style="list-style-type: none"> <li>• Micronutrients</li> </ul>
8.2 Research common nutrient deficiency symptoms and treatment options (i.e., fertilizers, soil amendments, crop rotation, etc.)	<ul style="list-style-type: none"> <li>• Deficiency symptoms and treatment</li> <li>• Soil Amendments</li> <li>• Fertilizer</li> <li>• Crop Rotations</li> </ul>
8.3 Prepare grow media for use in plant systems (i.e., soil, water, vermiculite, coconut core, etc.)	<ul style="list-style-type: none"> <li>• Soil</li> <li>• Water (Hydroponics)</li> <li>• Vermiculite</li> <li>• Coconut Core</li> </ul>
8.4 Analyze soil conditions to make nutritional decisions (i.e., pH meter, soil test kits, soil probes, etc.)	<ul style="list-style-type: none"> <li>• Soil Moisture</li> <li>• pH</li> <li>• Soil Probes</li> </ul>
8.5 Implement a fertilization plan for specific plants or crops	<ul style="list-style-type: none"> <li>• Fertilization Plan</li> </ul>
8.6 Investigate methods for sexual reproduction of plants (i.e., cross-pollination, scarification, stratification, etc.)	<ul style="list-style-type: none"> <li>• Cross- Pollination</li> <li>• Scarification</li> <li>• Stratification</li> </ul>
8.7 Investigate methods for asexual reproduction of plants (i.e., propagation, grafting, layering, tissue culture, plant hormones, etc.)	<ul style="list-style-type: none"> <li>• Propagation</li> <li>• Grafting</li> <li>• Layering</li> <li>• Tissue Culture</li> <li>• Plant Hormones</li> </ul>
8.8 Demonstrate plant propagation techniques (e.g., sexual and asexual)	<ul style="list-style-type: none"> <li>• Sexual Reproduction</li> <li>• Asexual Reproduction</li> </ul>
8.9 Describe techniques to harvest, handle, and store crops according to current industry standards	<ul style="list-style-type: none"> <li>• Harvesting and storage techniques for local crops</li> </ul>
8.10 Create a sustainable management plan for plant production	<ul style="list-style-type: none"> <li>• Sustainable management plan</li> </ul>
<b>STANDARD 9.0 ANALYZE ANIMAL SCIENCE PRINCIPLES</b>	
9.1 Define common terminology related to animal science and production practices (i.e., gender, age, dehorning, castration, identification, tail docking, etc.)	<ul style="list-style-type: none"> <li>• Common animal terminology</li> </ul>

9.2 Classify animals according to taxonomic classification systems and use (e.g., agricultural, companion)	<ul style="list-style-type: none"> <li>• Taxonomic Classification</li> <li>• Agricultural</li> <li>• Companion</li> </ul>
9.3 Differentiate among large stock, small stock, and companion animals	<ul style="list-style-type: none"> <li>• Large Stock</li> <li>• Small Stock</li> <li>• Companion Animals</li> </ul>
9.4 Explain basic anatomy and external parts of production animals	<ul style="list-style-type: none"> <li>• External Parts</li> </ul>
9.5 Apply principles of comparative anatomy and physiology to use within animal systems (e.g., musculoskeletal, epidermis, nervous, circulatory, respiratory, urinary, endocrine, reproductive)	<ul style="list-style-type: none"> <li>• musculoskeletal</li> <li>• epidermis (integumentary)</li> <li>• nervous</li> <li>• circulatory</li> <li>• respiratory</li> <li>• urinary</li> <li>• endocrine</li> <li>• reproductive</li> <li>• immune</li> </ul>
9.6 Describe a livestock animal's digestive system (i.e., ruminant, monogastric, lagomorphs, hind-quarter digestion, etc.)	<ul style="list-style-type: none"> <li>• Ruminant vs Monogastric</li> <li>• Modified Monogastric</li> <li>• Avian</li> </ul>
9.7 Describe the basic principles of animal welfare (e.g., water, food, proper handling, healthcare, facilities, appropriate environment)	<ul style="list-style-type: none"> <li>• Animal handling</li> <li>• Animal health care</li> </ul>
<b>STANDARD 10.0 DEMONSTRATE CONCEPTS OF ANIMAL MANAGEMENT</b>	
10.1 Recognize animal behaviors to facilitate safely working with animals	<ul style="list-style-type: none"> <li>• Temple Grandin</li> <li>• Fight or Flight</li> </ul>
10.2 Investigate the nature and properties of food, fiber, and by-products from animals	<ul style="list-style-type: none"> <li>• Animal By-products</li> </ul>
10.3 Differentiate between major wholesale/retail meat cuts of beef, pork, lamb, and poultry and compare the value of various meat cuts	<ul style="list-style-type: none"> <li>• Wholesale vs Retail Cuts</li> </ul>
10.4 Explore the use of alternative livestock in animal agriculture (i.e., antelope, elk, buffalo, alpacas, ostrich, deer, etc.)	<ul style="list-style-type: none"> <li>• Wildlife Management</li> <li>• Aquaculture</li> </ul>

10.5 Analyze the nutritional roles and needs of animals	<ul style="list-style-type: none"> <li>• Animal Nutrition</li> </ul>
10.6 Analyze feed rations to meet the nutritional needs of animals	<ul style="list-style-type: none"> <li>• Feed Stuffs</li> <li>• Pearson Square</li> </ul>
10.7 Develop a plan to treat animal ailments	<ul style="list-style-type: none"> <li>• Disease prevention/identification</li> <li>• Virus vs Bacteria (Vaccinations vs Antibiotics)</li> </ul>
10.8 Differentiate among animal selection, reproduction, breeding, and genetics	<ul style="list-style-type: none"> <li>• Understand different selection, breeding and genetic processes</li> </ul>
10.9 Demonstrate animal selection based on reproduction, breeding, and genetics	<ul style="list-style-type: none"> <li>• Pedigrees</li> <li>• Expected Progeny Differences (EPD)</li> <li>• Breeding Programs</li> </ul>
10.10 Explore how animals are evaluated for breeding readiness and soundness	<ul style="list-style-type: none"> <li>• Breeding characteristics</li> <li>• Ages</li> <li>• Health</li> <li>• Weight</li> <li>• Nutrition</li> </ul>
10.11 Create a sustainable reproduction management plan	<ul style="list-style-type: none"> <li>• Breeding management plan</li> </ul>
10.12 Demonstrate proper methods to clean and disinfect animal equipment and facilities	<ul style="list-style-type: none"> <li>• Methods to clean and disinfect</li> </ul>
10.13 Demonstrate proper use of animal medications following established withdrawal protocols	<ul style="list-style-type: none"> <li>• Animal Medication Labels</li> </ul>
<b>STANDARD 11.0 ANALYZE PRINCIPLES OF INTEGRATED PEST MANAGEMENT (IPM) IN PLANT AND ANIMAL SYSTEMS</b>	
11.1 Identify pests and signs of pest damage (i.e., parasites, rodents, weeds, insects, etc.)	<ul style="list-style-type: none"> <li>• Agricultural Pests and damage left to plants/animals</li> </ul>
11.2 Identify pest control methods used to manage pest damage (i.e., cultural, mechanical, biological, chemical, etc.)	<ul style="list-style-type: none"> <li>• Cultural</li> <li>• Mechanical</li> <li>• Biological</li> <li>• Chemical</li> </ul>

11.3 Evaluate economic impact of pests on production	<ul style="list-style-type: none"> <li>• Money Lost</li> <li>• Pesticide Usage</li> </ul>
11.4 Discuss biosecurity measures utilized to protect the welfare of animals on a local, state, national, and global level	<ul style="list-style-type: none"> <li>• Biosecurity Measures</li> </ul>
11.5 Read and interpret pesticide labels	<ul style="list-style-type: none"> <li>• Pesticide Labels</li> </ul>
11.6 Investigate safe pesticide application practices	<ul style="list-style-type: none"> <li>• Proper Pesticide Handling</li> </ul>
11.7 Apply pesticides safely according to good manufacturing practices (GMPs)	<ul style="list-style-type: none"> <li>• SDS Procedures</li> </ul>

<b>Domain 3: Agricultural Business</b>	
<b>Instructional Time: 10-20%</b>	
<b>STANDARD 15.0 DEMONSTRATE AGRIBUSINESS MANAGEMENT, FINANCE, AND MARKETING SKILLS</b>	
15.1 Define basic business terminology (i.e., entrepreneurship/placement, capital, budget, solvent, management, assets, liability, economics, etc.)	<ul style="list-style-type: none"> <li>• Business terminology</li> <li>• Entrepreneurship vs Placement</li> <li>• Sole-proprietor vs corporation</li> </ul>
15.2 Differentiate between macro- and micro-economics	<ul style="list-style-type: none"> <li>• Macroeconomics vs Microeconomics</li> </ul>
15.3 Identify financial records important to business management	<ul style="list-style-type: none"> <li>• Balance Sheet</li> <li>• Inventory</li> </ul>
15.4 Use management software and information technology [i.e., spreadsheets, databases, presentation software, record-keeping software, electronic record book, agriculture experience tracker (AET), etc.]	<ul style="list-style-type: none"> <li>• AET</li> <li>• Record Keeping</li> </ul>
15.5 Analyze business records and record-keeping procedures	<ul style="list-style-type: none"> <li>• Profit vs Loss</li> </ul>
15.6 Identify tax structure of agricultural business (i.e., property tax, intangible taxes, income taxes, etc.)	<ul style="list-style-type: none"> <li>• Property Tax</li> <li>• Intangible Taxes</li> <li>• Income Tax</li> </ul>

15.7 Apply the decision-making process for budgeting issues	<ul style="list-style-type: none"> <li>• Wants vs Needs</li> <li>• Risk Analysis</li> </ul>
15.8 Identify methods of obtaining capital resources	<ul style="list-style-type: none"> <li>• Loans</li> <li>• Grants</li> <li>• Subsidies</li> </ul>
15.9 Explain the purposes and structures of contracts, leases, deeds, and insurance policies	<ul style="list-style-type: none"> <li>• Liability</li> <li>• Risk Management</li> </ul>
15.10 Compare types of markets and influence factors (i.e., commodity markets, foreign markets, competition, etc.)	<ul style="list-style-type: none"> <li>• Commodity markets</li> <li>• Foreign Markets</li> <li>• Competition</li> </ul>
15.11 Identify methods of managing risk	<ul style="list-style-type: none"> <li>• Accept, Avoid, Transfer, Mitigate, Exploit</li> </ul>
15.12 Describe the purpose and importance of marketing	<ul style="list-style-type: none"> <li>• Marketing and Communications</li> </ul>
15.13 Develop a marketing plan	<ul style="list-style-type: none"> <li>• Marketing Plan</li> </ul>
15.14 Create a business plan	<ul style="list-style-type: none"> <li>• Business Plan</li> </ul>

<b>Domain 4: Agricultural Mechanics</b>	
<b>Instructional Time: 5-10%</b>	
<b>STANDARD 13.0 APPLY PRACTICES AND PROCEDURES FOR PLANNING, BUILDING, AND MAINTAINING STRUCTURES</b>	
13.1 Identify legal land descriptions	<ul style="list-style-type: none"> <li>• Legal Land Descriptions</li> <li>• Township, section, baseline, meridian</li> </ul>
13.2 Investigate techniques used to survey land	<ul style="list-style-type: none"> <li>• Surveying Techniques: Laser, Manual, Drone</li> </ul>
13.3 Create sketches and plans for structures	<ul style="list-style-type: none"> <li>• Sketches and plans for structures</li> </ul>
13.4 Determine structural requirements, specifications, and estimate costs for structures (i.e., bill of materials)	<ul style="list-style-type: none"> <li>• Bill of Materials</li> <li>• Measurements</li> </ul>

13.5 Follow architectural and mechanical plans to construct, maintain, and/or repair agricultural structures (e.g., material selection, site preparation and/or layout, plumbing, concrete/masonry, electrical wiring, wood fabrication)	<ul style="list-style-type: none"> <li>• Material selection</li> <li>• Site preparation and/or layout</li> <li>• Plumbing</li> <li>• Concrete/Masonry</li> <li>• Electrical Wiring</li> <li>• Wood Fabrication</li> </ul>
13.6 Design animal, plant, and mechanical facilities including equipment	<ul style="list-style-type: none"> <li>• Design Livestock Facilities</li> <li>• Landscape Design</li> </ul>
13.7 Manage basic facility maintenance, installation, or repair	<ul style="list-style-type: none"> <li>• Facilities maintenance and repair</li> </ul>
<b>STANDARD 14.0 DEMONSTRATE OPERATION OF TOOLS, EQUIPMENT, AND INSTRUMENTS</b>	
14.1 Demonstrate safe operating instructions and procedures as recommended by the manufacturer	<ul style="list-style-type: none"> <li>• Owner's manual</li> <li>• Shop Safety Procedures</li> </ul>
14.2 Utilize service manuals to perform preventative maintenance and determine scheduled service on tools, equipment, and instruments, including small engines	<ul style="list-style-type: none"> <li>• Preventative maintenance</li> </ul>
14.3 Maintain hand tools and power equipment (i.e., hand saws, power saws, welders, leaf blowers, etc.)	<ul style="list-style-type: none"> <li>• Sharpening blades</li> </ul>
14.4 Demonstrate a variety of metal fabrication, welding, soldering, cutting, and finishing processes (i.e., SMAW, GMAW, GTAW, fuel-oxygen, plasma arc torch, etc.)	<ul style="list-style-type: none"> <li>• Metal fabrication processes</li> </ul>
14.5 Demonstrate a variety of wood fabrication and finishing processes	<ul style="list-style-type: none"> <li>• Wood fabrication processes</li> </ul>
14.6 Service electrical systems and components of mechanical equipment and power systems using a variety of troubleshooting and/or diagnostic methods	<ul style="list-style-type: none"> <li>• Electrical systems diagnostics and repair</li> <li>• Basic electricity</li> </ul>
14.7 Utilize manufacturers' guidelines to diagnose, troubleshoot, and repair machinery, equipment, and power source systems (i.e., hydraulic, pneumatic, transmission, steering, suspension, etc.)	<ul style="list-style-type: none"> <li>• Machinery repair</li> </ul>