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| **PLANT SYSTEMS, 01.0100.30** |
| **1.0** | **DEMONSTRATE LABORATORY PROCEDURES AND SAFETY PRACTICES** |
| **1.1** | Demonstrate safe practices in a home, classroom, laboratory, and work situation |
| **1.2** | Identify safety precautions that involve working with hazardous biological materials |
| **1.3** | Examine the impact of safety compliance on business and employees  |
| **1.4** | Interpret parts of an MSDS sheet |
| **1.5** | Interpret recommended personal protection equipment (PPE)  |
| **1.6** | Safely operate and maintain equipment |
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| **2.0** | **DESCRIBE CELL BIOLOGY STRUCTURES AND PROCESSES** |
| **2.1** | Explore the cells, tissues, and organs  |
| **2.2** | Recognize the structure and function of DNA |
| **2.3** | Explain the process of creating proteins from DNA |
| **2.4** | Explain the role of the cell and cellular processes (i.e. , mitosis, meiosis, osmosis)  |
| **2.5** | Examine the molecular basis of heredity and resulting genetic diversity |
| **2.6** | Specify methods and requirements by which an organism’s genetic code can be altered using biotechnology techniques  |
| **2.7** | Determine how scientists continue to investigate and critically analyze DNA cloning  |
| **2.8** | Outline the scientific principles and processes involved in biological evolution |
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| **3.0** | **DESCRIBE BASIC PRINCIPLES OF NUTRITION** |
| **3.1** | Determine the essential nutrients for organisms and describe their importance |
| **3.2** | Explore the nutritional needs of humans, animals and/or plants |
| **3.3** | Explain the process of food digestion and nutrient absorption |
| **3.4** | Identify common nutrition problems |
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| **4.0** | **DESCRIBE SCIENTIFIC CLASSIFICATION** |
| **4.1** | Investigate the seven levels of classifications (Kingdom, Division, Class, Order, Family, Genus, Species) |
| **4.2** | Investigate the five kingdoms (Bacteria, Protists, Fungi, Plants, Animals) |
| **4.3** | Create and utilize a dichotomous key  |
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| **5.0** | **DESCRIBE PRINCIPLES OF PLANT GROWTH AND PRODUCTION** |
| **5.1** | Identify parts of plants and their functions |
| **5.2** | Explore methods of classifying plants |
| **5.3** | Recognize the physiological needs of plants |
| **5.4** | Explain plant sexual and asexual reproduction |
| **5.5** | Demonstrate plant propagation  |
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| **6.0** | **DESCRIBE PRINCIPLES OF ANIMAL GROWTH AND PRODUCTION** |
| **6.1** | Describe the epidermis system |
| **6.2** | Describe the musculoskeletal system |
| **6.3** | Describe the nervous system |
| **6.4** | Describe the circulatory system |
| **6.5** | Describe the respiratory system |
| **6.6** |  Describe the digestive system |
| **6.7** | Describe the urinary system |
| **6.8** | Describe the reproductive system |
| **6.9** | Describe the endocrine system |
| **6.10** | Recognize the physiological needs of living animals |
| **6.11** | Explore animal health control practices |
| **6.12** | Explain animal reproduction practices |
| **6.13** | Explore benefits to health care that have resulted from advances in technology |
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| **7.0** | **USE SCIENTIFIC PROCESSES TO ANALYZE DATA** |
| **7.1** | Formulate predictions, questions, or hypotheses based on observations |
| **7.2** | Evaluate appropriate resources for research  |
| **7.3** | Illustrate the scientific method |
| **7.4** | Design and conduct controlled investigations |
| **7.5** | Design data tables, charts, and graphs  |
| **7.6** | Record observations, notes, sketches, questions, and ideas during the investigation  |
| **7.7** | Analyze data to explain results and propose further investigations |
| **7.8** | Communicate conclusions of investigations |
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| **8.0** | **DESCRIBE THE PRINCIPLES OF ECOLOGY & ENVIRONMENTAL SCIENCE**  |
| **8.1** | Analyze the organization of living systems |
| **8.2** | Recognize the role of energy within living systems |
| **8.3** | Analyze the symbiotic relationships among various organisms and their environment |
| **8.4** | Discuss the different classifications of natural resources in the environment |
| **8.5** | Evaluate environmental and natural resource sciences |
| **8.6** | Evaluate sustainable agriculture systems |
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| **9.0** | **DISCUSS BIOTECHNOLOGY** |
| **9.1** | Analyze how specific cultural and/or social issues promote or hinder scientific advancements |
| **9.2** | Evaluate new agricultural products developed as a result of advances in technology |
| **9.3** | Examine the effects of biotechnology on food safety and processing techniques  |
| **9.4** | Discuss how biotechnology has improved nutrition |
| **9.5** | Discuss biotechnology techniques that have contributed to improved health |
| **9.6** | Explain how biotechnology has influenced medicines |
| **9.7** | Compare the impact of biotechnology on the length and quality of life |
| **9.8** | Describe the effects of technology and biotechnology on the environment |
| **9.9** | Describe benefits to the environment as a result of advances in technology |
| **9.10** | Compare the impact of biotechnology on the production, processing, storage, and preparation of food  |
| **9.11** | Discuss the effects of plant biotechnology in sustainable agriculture systems |
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| **10.0** | **DESCRIBE FOOD SAFETY AND PROCESSING PRACTICES** |
| **10.1** | Identify food safety practices |
| **10.2** | Describe food-processing practices |
| **10.3** | Identify new and innovative food products developed as a result of advances in technology |
| **10.4** | Investigate food labeling practices  |
| **10.5** | Compare marketing techniques in the food industry |
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| **11.0** | **INVESTIGATE ETHICS IN THE AGRICULTURE INDUSTRY** |
| **11.1** | Assess ethics in leadership and agricultural production  |
| **11.2** | Evaluate business dealings with friends, family, or competitors |
| **11.3** | Evaluate pricing and sales incentives |
| **11.4** | Evaluate potential environmental damage of agriculture practices |
| **11.5** | Discuss bioethical issues  |
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| **12.0** | **ANALYZE AGRICULTURAL LITERACY TOPICS**  |
| **12.1** | Discuss the development of agriculture in America |
| **12.2** | Examine Arizona agriculture and its advancements |
| **12.3** | Discuss misconceptions in agriculture |
| **12.4** | Differentiate between standard operating procedures on commercial, small scale, and organic production techniques |
| **12.5** | Describe the facets of agriculture  |
| **12.6** | Discuss how regulatory agencies affect agriculture  |
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| **13.0** | **INVESTIGATE APPROVED PRACTICES OF DISEASE CONTROL** |
| **13.1** | Differentiate between common diseases |
| **13.2** | Assess symptoms of common diseases and parasites |
| **13.3** | Evaluate economic impact of diseases on production |
| **13.4** | Compare methods by which diseases are spread |
| **13.5** | Evaluate the most economical and environmentally safe disease control and prevention methods  |
| **13.6** | Conduct an investigation on an infected field/organism |
| **13.7** | Propose corrective actions needed to treat an infected field/organism |
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| **14.0** | **INVESTIGATE APPROVED NUTRITIONAL PRACTICES** |
| **14.1** | Research common nutrient deficiency symptoms and treatment options |
| **14.2** | Recommend nutrient and quantity requirements |
| **14.3** | Evaluate diagnosis, treatment, and prevention of nutrient deficiency |
| **14.4** | Inspect supplemental and additive ration/fertilizer composition |
| **14.5** | Prepare samples for testing and diagnosis |
| **14.6** | Test methods of fertilizer/nutrient application |
| **14.7** | Examine the relationship between nutrient practices and yield amounts |
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| **15.0** | **ANALYZE THE INTERACTION AMONG ENVIRONMENTAL AND NATURAL RESOURCES SCIENCES**  |
| **15.1** | Demonstrate how dynamic processes such as weathering, erosion, and sedimentation relate to redistribution of materials in the earth system |
| **15.2** | Investigate soil morphology |
| **15.3** | Illustrate land-use and water-use planning |
| **15.4** | Explain factors that impact current and future water quantity and quality including surface, ground, and local water issues |
| **15.5** | Compare fossil fuels and biofuels and how they are affecting the environment |
| **15.6** | Describe how human activities and natural causes can lead to pollution |
| **15.7** | Evaluate the effectiveness of conservation practices on environmental quality and biodiversity  |
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| **16.0** | **INVESTIGATE IMPACTS OF INTEGRATED PEST MANAGEMENT OPTIONS** |
| **16.1** | Classify common pests |
| **16.2** | Evaluate economic impact of pests on production  |
| **16.3** | Predict methods by which pests spread |
| **16.4** | Recognize signs of pest damage |
| **16.5** | Identify thresholds created for specific pests |
| **16.6** | Select and propose the most economical and environmentally safe pest control method |
| **16.7** | Identify GMO crops and their role in the agriculture industry |
| **16.8** | Read and interpret pesticide labels |
| **16.9** | Apply pesticide effectively |
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| **17.0** | **DEMONSTRATE AGRISCIENCE MECHANIC APPLICATIONS** |
| **17.1** | Demonstrate personal and group safety |
| **17.2** | Develop a bill of materials for a specific task |
| **17.3** | Develop a structural plan for a specific task |
| **17.4** | Demonstrate appropriate wood fabrication techniques |
| **17.5** | Demonstrate appropriate metal fabrication techniques |
| **17.6** | Demonstrate appropriate plumbing fabrication techniques used in agriculture |
| **17.7** | Demonstrate appropriate safe connection of electrical componentsincluding motors, timers, and values in both high- and low-voltage circuitsused in agriculture |
| **17.8** | Demonstrate appropriate concrete and masonry practices commonly used in agriculture  |
| **17.9** | Demonstrate operation and maintenance of appropriate mechanicalsystems used in agriculture |
| **17.10** | Demonstrate appropriate land measurement and construction techniques commonly used in agriculture with technology |
| **17.11** | Demonstrate principles and applications of various engines and machinery used in agriculture |
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| **18.0** | **Apply Business Practices in the Agricultural Industry** |
| **18.1** | Determine entrepreneurship opportunities in agriculture |
| **18.2** | Develop a marketing plan  |
| **18.3** | Research a product and demonstrate approved sales techniques  |
| **18.4** | Apply record keeping principles and applications |
| **18.5** | Analyze tax laws and regulations  |
| **18.6** | Discuss personal and business accounting practices |
| **18.7** | Explain economic principles in agriculture  |
| **18.8** | Utilize technology to accomplish agribusiness objectives |
| **18.9** | Research investment opportunities |
| **18.10** | Design an agricultural business plan |
| **18.11** | Compare projected and actual budgets to calculate business decisions  |
| **18.12** | Review risk management strategies such as insurance, hedging, and business decisions  |
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| **19.0** | **Demonstrate An Understanding of the Role of Plant Systems in the Agricultural Industry** |
| **19.1** | Apply knowledge of practices and procedures in Plant Systems |
| **19.2** | Apply knowledge of practices and procedures in work-based learning |
| **19.3** | Apply knowledge of practices and procedures in leadership development |