Curriculum Resources for Michigan Agriculture Teachers - Website Curriculum Tool

Segments, Standards, and Core Ideas

The following document organizes the core ideas generated by AFNR educators in the state of Michigan that are included in this comprehensive curriculum tool.

1. Safety

* Examine health risks associated with a particular skill to better form personnel safety guidelines
  + Health Risks
  + Safety Guidelines
  + Biological Safety
  + Mechanical Safety
  + Chemical Safety
* Develop response plans to handle emergencies.
  + Emergency Assessment
  + Plan Development
  + Practical Response Plans
* Identify hazards and acquire first aid skills to promote environmental safety
  + Safety Inspection
  + Basic First Aid
* Examine required regulations to maintain/improve safety, health, and environmental management systems and sustain business practices
  + Chemical Regulations
  + USDA Regulations
  + OSHA
  + Site Policies
* Enact procedures that demonstrate the importance of safety, health, and environmental responsibilities in the workplace.
  + Safety Procedures
  + Reporting Procedures
* Demonstrate methods to correct common hazards.
  + Site Map
  + Personal Protective Equipment
  + Standard Operating Procedures
* Demonstrate application of personal and group health and safety practices.
  + Integration of safety principles into all aspects of the ag program
  + Responsible Student Behavior

1. Animal Anatomy & Physiology

* Apply principles of comparative anatomy and physiology to uses within various animal systems.
  + Comparative Anatomy
  + Physiology
* Demonstrate safe animal handling and management techniques.
  + Animal Handling Safety
  + Animal Housing
* Implement procedures to ensure that animal products are safe.
  + Food Safety
  + Products & By-Products
* Examine animal developmental stages.
  + Examine Developmental Stages
  + Life Cycle
  + Gestational Length
* Describe basic functions of animal cells, organs and systems.
  + Cell Structure
  + Cell Processes
  + Body Systems
* Explain how the components and systems of animal anatomy and physiology related to the production and use of animals.
  + Animal Evaluation

1. Animal Genetics & Reproduction

* Select animals for specific purposes and maximum performance based on anatomy and physiology.
  + Purebred vs. Mixed Breed
  + Selective vs. Natural
  + Evolution of Organisms
* Evaluate the male and female reproductive systems in selecting animals.
  + Artificial Insemination & Embryo Transfer/Flushing
  + Castration
  + Reproductive Systems
* Evaluate animals for breeding readiness and soundness.
  + Animal Selection & Evaluation for breeding purposes
* Apply scientific principles in the selection and breeding of animals.
  + Punnett Squares
  + Pedigrees
  + Animal Breeding and Color Genetics
  + Designer Breeds

1. Domestic Animal Production

* Evaluate the development and implications of animal origin, domestication and distribution.
  + Animal Domestication
  + Animal/Product Distribution
* Classify animals according to hierarchical taxonomy and agricultural use.
  + Taxonomy
  + Agricultural Use
* Design animal housing, equipment and handling facilities for the major systems of animal production.
  + Designing Animal Handling Facilities and Using Equipment
* Comply with government regulations and safety standards for facilities used in animal productions.
  + Government Regulation
* Explain the variety and scope of managed animal systems in the United States and around the world including: livestock, aquaculture, companion animals, zoo animals, and exotic animals.
  + Animal Identification and Record Keeping
  + Poultry
  + Aquaponics
  + Livestock
  + Companion Animals
  + Zoo Animals
  + Exotic Animals
* Explain the historical development of animal systems around the world.
  + Breed Identification
* Describe trends in the animal in the animal systems industry.
  + Animal Welfare vs. Rights
  + Organic vs. Conventional
  + Confinement vs. Pasture
  + Current Consumption Trends
* Recognize the historical, social, cultural and potential applications of biotechnology in the animal systems industry.
  + Current and Potential Biotechnology Applications
  + Social Implications of Biotechnology
  + Historical Implications of Biotechnology
  + Cultural Implications of Biotechnology

1. Animal Health & Nutrition

* Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.
  + Zoonotic Diseases
  + Disease and Parasitology
  + Veterinary Office Procedures
  + Complete Animal Health Checks
* Provide for the biosecurity of agricultural animals and production facilities.
  + Biosecurity
* Formulate feed rations to provide for the nutritional needs of animals.
  + Feed Rations
  + Nutrition
* Prescribe and administer animal feed additives and growth promotants in animal production.
  + Feed Additives
* Assess whether the nutritional requirements of a given animal are being met by recording performance and comparing feed variations.
  + Record Keeping
  + Feed Trails
* Design a nutritional plan for a given animal with a clearly stated outcome.
  + Calculate Nutrient Requirements
  + Evaluate a Proposed Plan for Effectiveness and Economical Feasibility
  + Create a Balanced Ration for a Given Animal

1. Plant & Animal Physiology

* Classify agricultural plants according to taxonomy systems.
  + Hierarchical Classification
  + Dichotomous Keys
  + Importance of Taxonomy
* Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems
  + Plant Structures
  + Plant Reproductive Anatomy
* Apply knowledge of plant physiology and energy conversion to plant systems.
  + Photosynthesis/Cellular Respiration and Energy Conversion
  + Plant Physiology
  + Plant Cells
  + Mitosis/Meiosis
* Examine unique plant properties to identify/describe functional differences in plant structures including roots, stems, flowers, leaves, and fruit.
  + Plant Structures
  + Plant Reproductive Anatomy
* Classify plants based on physiology for taxonomic or other classifications.
  + Classify Plants Based on Leaf and Structures
  + Using Dichotomous Key to Compare Plants by their Structural Differences
  + Weed Management and Identification
* Apply knowledge of plant physiology and energy conservation to plant systems activities
  + Photosynthesis/Cellular Respiration and Energy Conversion
  + Plant Physiology
  + Plant Cells
  + Mitosis/Meiosis

1. Soils & Plant Nutrition

* Develop and implement a fertilization plan for specific plants or crops.
  + Signs of Nutrient Deficiencies
  + Soil Test and Analysis
  + Fertilizer Labels
  + Fertilizer Calculations
* Develop a fertilization plan using the results of an analysis and evaluation of nutritional requirements and environmental conditions.
  + Nutrient Plan
  + Sources of Nutrients
  + Nutrient Application
  + Nutrient Management/Pollution
* Evaluate soil/media nutrients using tests of appropriate materials and/or by examining data
  + Soil profiling & Analysis
  + Soil Surveys

1. Plant Culture & Propagation
   * Determine the influence of environmental factors on plant growth.
     + Germination Factors
     + Environmental Factors
   * Prepare growing media for use in plant systems
     + Types of Growing Media
     + Preparing Growing Media
     + Basics of Composting
   * Demonstrate plant propagation techniques
     + Sexual Propagation
     + Asexual Propagation
     + Intro/basics of Hydroponics
   * Develop and implement a plant management plan for crop production.
     + Basic Farm Business Information
     + Nutrient & Waste Management
     + Land Treatment and Application Processes
     + Scouting & Crop Management
     + Record Keeping
   * Develop and implement a plan for integrated pest management.
     + Steps of IPM
     + IPM Methodology
   * Harvest, handle, and store crops.
     + Planning greenhouse sales and land lab
     + Storage Methods for Different Crops
     + Greenhouse/Garden Crop Harvest
   * Manage water conditions for plant growth.
     + Water Testing
     + Water Quality Management
     + Types of Watering Systems
     + Aquaponics and Hydroponics
   * Manage characteristics of growing media.
     + Controlling Fungus/Diseases
     + Storing Soil Mixtures
     + Transplanting Soil to Soil
     + Nutrient Checks
     + Sterilization
   * Develop a production plan that applies the fundamentals of plant management.
     + Plant Care
     + Plant Diseases
     + Greenhouse/Hoop House Production and Management
     + Landscaping
     + Crop Production and Management
   * Store crops using methods that apply fundamentals of plant management.
     + Washing
     + Packing
     + Storage Temperatures and Humidity
   * Produce crops using a plant management plan
     + Basic Operation Business Information
     + Nutrient & Waste Management
     + Crop Treatment and Application
     + Scouting & Crop Management
     + Record Keeping
   * Demonstrate plant propagation techniques.
     + Sexual propagation
     + Asexual propagation
     + Intro/basics of Hydroponics
2. Natural Resource Systems

* Apply knowledge of natural resource components to the management of natural resource systems.
  + Atmosphere
  + Biosphere
  + Geosphere
  + Hydrosphere
  + Renewable vs. Nonrenewable Resources
  + Natural Resource Management
* Apply scientific principles of an ecosystem.
  + Organization of Ecosystems
  + Energy Pyramid
  + Biotic/Abiotic
  + Habitat vs. Niche
  + Invasive Species
* Demonstrate evidence of interest and concern for natural resource stewardship.
  + Identifying Current/Local Issues
  + Environmental Problem Solving
  + Conservation vs. Preservation
* Explain the environmental considerations of decision making in AFNR management.
  + Environmental Considerations
  + Issues Identification
  + Define AFNR
  + Decision Making Process
* Explain foundational cycles and systems of AFNR.
  + Water Cycle
  + Nutrient Cycles
* Explain the interconnectedness of systems within AFNR.
  + Ecology
  + Ecological Balance

1. Environmental Service Systems

* Reduce the effects of animal production on the environment
  + Manure Management
  + Grazing Practices
  + Pollution Control
* Evaluate the effects of environmental conditions on animals.
  + Basic Needs
  + Animal Populations
  + Animal Performance
* Apply principles and practices of sustainable agriculture to plant production (i.e., describe sustainable production).
  + Urban Agriculture
  + Sustainable Practices
  + Aquaponics and Hydroponics
* Apply principles and practices of sustainable agriculture to plant production (i.e., calculate cost/benefits, plan production, identify certifying options)
  + Organic Certification
  + GMO Regulations
  + Traditional vs. Sustainable
* Demonstrate the application of biotechnology to plant production.
  + Genetically Modified Organisms
  + Specialized Chemicals
  + Biofuels
* Explain how regulations and major laws impact management of AFNR activities.
  + ANFR Legislation
  + Individual Resource Management
  + Implications of Policy on Agriculturalists
* Describe current issues impacting AFNR activities.
  + Types of Issues in Agriculture
* Identify, organize alternatives, and evaluate public policy issues related to AFNR.
  + Research Current Policy
  + Evaluate Policy
  + Analyzing Alternatives
* Consider public input in decision making for AFNR activities.
  + Identify Stakeholders
  + Informing Opinions
* Explain the impact of sustainability on AFNR activities and practices.
  + Economic Impacts
  + Social Impacts
  + Environmental Impacts
  + Balancing Impacts
* Recognizing the historical, social, cultural, and potential applications of biotechnology on AFNR activities.
  + History of Biotechnology
  + Current and Potential Biotechnology Applications
* Demonstrate the application of biotechnology to AFNR activities
  + Biotechnology in Food
  + Biotechnology in Agriculture
  + Biotechnology in the Environment

1. Agriculture Business & Marketing

* Describe AFNR businesses and identify global opportunities in agriculture
  + Basic Types of AFNR Businesses
  + International Agriculture
  + World and US Food Production
* Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
  + Loans and Credits
  + Taxes
  + AFNR regulations
  + Business and Personal Finance
* Demonstrate knowledge of principles in marketing within an AFNR business.
  + Stocks
  + Future Markets
  + Marketing
* Demonstrate knowledge of an AFNR business plan
  + Components of AFNR Business Plans
  + Assess Business Plans
  + Create a Business Plan
* Examine company performance and goals within AFNR organizations and the AFNR industry.
  + Examine Company Hierarchy
  + Cash Flow Analysis
  + Goal Setting
* Examine the role of AFNR in global, national, and regional economies
  + Distribution Channels
  + Economics
  + Tariffs
* Explain the types of industries, organizations, and activities that are a part of AFNR.
  + Types of Ag Business
  + Business Structures
* Explain the influence of AFNR on society.
  + Current Market Trends
  + Effects of Agricultural Marketing
* Consider the environmental, social, and economic impacts of decisions.
  + Laws, Policies of Agencies
  + Sustainability
  + Impacts of Decisions
  + Current AFNR Issues

1. Career Readiness & Leadership

* Locate and identify career opportunities that appeal to personal career goals.
  + Career Clusters
  + Educational and Job Requirements
  + Experiential Learning
* Match personal interests and aptitudes to selected careers.
  + Leadership Traits
  + Self-Evaluation
* Provide examples and descriptions of various careers in each of the AFNR pathways.
  + Career Research
* Act as a responsible and contributing citizen and employee
  + Employability Skills
  + Citizenship
* Apply appropriate academic and technical skills.
  + Academics
  + Technical Skills
* Attend to personal health and financial well-being.
  + Personal Finance
  + Personal Health
* Communicate clearly, effectively, and with reason.
  + Workplace Communication
  + Advocacy
  + Effective Communication
* Demonstrate creativity and innovation.
  + Types of Divergent Thinking
  + Environmental Characteristics of Creativity
  + Stages of the Creative Process
* Employ valid and reliable research strategies.
  + Reliable Research Strategies
* Model integrity, ethical leadership, and effective management.
  + FFA 101
  + Leadership/Mentorship
* Plan education and career path aligned to personal goals.
  + Personal and Career Goal Setting
  + Career and College Prep
* Use technology to enhance productivity.
  + Utilizing technology
* Utilize critical thinking to make sense of problems and persevere in solving them.
  + Problem Based Learning
* Work productively in teams while using cultural/global competence.
  + Team Building