

## Introduction to Agricultural Science and Technology

- Examine financial literacy as it applies to agricultural business and Supervised Agricultural Experience.
- Assess the relevance of agricultural science to the individual, society and the environment
- Model problem solving and critical thinking skills through agricultural experiences and examples.
- Support STEM goals through applied agricultural science and technology
- Design a plan for college and career readiness in agricultural sciences
- Interpret agricultural terminology through agricultural applications
- Support and apply leadership opportunities in agricultural science through National FFA Organization involvement.

### **Standard**

#### Indicators

#### Sub-Indicators

### **AE.AST.10 – Compare Financial Literacy Practices as they relate to agricultural businesses.**

AE.AST.10.01 Apply financial literacy reasoning in order to make informed, financially responsible decisions.

AE.AST.10.02 Relate choices regarding their education and career paths to earning potential.

AE.AST.10.03 Develop skills to plan and manage money effectively by identifying financial goals and developing spending plans.

AE.AST.10.04 Develop skills to make informed decisions about incurring debt and maintaining credit worthiness.

AE.AST.10.05 Develop skills to plan and achieve long-term goals related to saving and investing in order to build financial security and wealth.

AE.AST.10.06 Develop financial planning skills to minimize financial setbacks.

### **AE.AST.15 – Explore Leadership development opportunities related to pursuing a career in agriculture**

AE. AST.15.01 Interpret the significance and meaning of the creed, salute, motto, mission, goals, ceremonies, traditions and history in organizations such the National FFA Organization.

AE. AST.15.02 Investigate youth development opportunities that prepares students for advancement in an agricultural career pathway.

AE. AST.15.03 Explain the significant contributions that the FFA organization has made to the development of leadership for the agricultural industry.

AE.AST.15.04 Understand the structure of organizations related to the agriscience industry.

### **AE.AST.20 – Develop professional oral/written communication skills as related to gainful employment in the agriculture industry.**

AE.AST.20.01 Examine the steps in preparing and delivering a public presentation on an agricultural topic.

AE. AST.20.02 Determine the order of business and agenda for a school-based organization meeting.

AE. AST.20.03 Apply parliamentary procedure practices in order to appropriately transact an item of business.

### **AE.AST.25 – Explore biotechnology applications in the agriculture industry.**

AE.AST.25.01 – Compare methods of plant and animal improvement as a result of biotechnology.

AE.AST.25.02 – Determine the value of agricultural biotechnology applications related to the food, fiber, and natural resource system.

AE.AST.25.03 – Explore concepts and safe practices as related to the use of biotechnology in the production of agricultural products.

AE.AST.25.03a – Explore the structure of DNA as related to examples of agricultural plants and animals.

AE.AST.25.03b – Investigate recombinant DNA technology and related safety concerns found in the use of agricultural biotechnology.

**AE.AST.30 SAE – Apply employability skills in work-based learning and career planning activities in order to understand the needs of today’s agricultural workplace.**

AE. AST.30.01 Establish a plan for a work-based learning experience program that will allow progress into an agricultural career.

AE. AST.30.02 Apply basic financial record keeping skills for the establishment of a work-based learning experience program.

\*These objectives will be treated together as objective 10.02 applies many of the principles of objective 30.01

**AE.AST.35 - Interpret career opportunities as related to the agricultural science and technology field.**

AE.AST.35 - Describe careers relating to plant science, animal science, agricultural engineering, environmental and natural resources and biotechnology.

**AE.AST.40 - Recognize the influence and impact of agriculture on the development of nations around the world.**

AE.AST.40.01 - Describe historical agricultural discoveries that increased the global production of food and fiber.

AE.AST.40.02 - Name agricultural science products and their impact on national and international economic growth.

AE.AST.40.3 – Compare the current and future issues in global agriculture.

**Animals**

**AE.AST.45 - Analyze the differences between the agricultural animal industries as related to their impact on the agricultural economy.**

AE.AST.45.01 Evaluate the various species of agricultural animals as related to their uses.

AE.AST.45.02 Evaluate the various species of agricultural animals as related to their economic importance and impact on society.

AE.AST.45.03 Classify the major breeds of agricultural animals.

**AE.AST.50 - Explore animal anatomy in relation to agricultural animal management.**

AE.AST.50.01 Determine nutritional requirements for agricultural animals found in Maryland.

AE.AST.50.02 Compare digestive systems of agricultural animals.

AE.AST.50.03 Identify and describe major organ systems: respiratory, circulatory, reproductive, skeletal and muscular.

**Plants**

**AE.AST.55 - Analyze relationships among air, soil, water and plant nutrients required for plant growth.**

AE.AST.55.01 Analyze basic soil and media requirements for growth of agricultural crops.

AE.AST.55.02 Explain nutrient requirements and soil amendments needed for the growth of agricultural crops.

AE.AST.55.03 Discuss the soil profile and soil sampling for surface and subsurface layers.

**AE.AST.60 – Analyze the role of photosynthesis, respiration and transpiration in plants as related to agricultural crops.**

AE.AST.60.01 Explain the function of major plant parts as related to plant growth and health.

AE.AST.60.02 Explore the photosynthesis process as related to the growth and development of a plant.

AE.AST.60.03 Demonstrate sexual and asexual methods of propagation.

AE.AST.60.04 Model practices to design and plan a garden project.

AE.AST.60.05 Investigate major plant science industries.

**AE.AST.65 – Compare the anatomical parts and distinguishing characteristics of agricultural crops.**

AE.AST.65.01 Identify the major parts of a plant including the anatomical parts and distinguishing characteristics of each.

AE.AST.65.02 Describe the functions of the major parts of a plant and their relationship to each other.

**AE.AST.70 – Model introductory principles of floral design**

AE.AST.70.01 Construct a floral design project using introductory principles.

**Ag Engineering**

**AE.AST.75 – Identify facility standards for agricultural businesses.**

AE.AST.75.01 Demonstrate safe practices.

AE.AST.75.02 Apply safe and efficient methods for designing an agricultural business.

AE.AST.75.03 Review and utilize government regulations and safety standards as they apply to agricultural businesses.

**AE.AST.80 – Develop a working knowledge of the tools and measuring instruments used in an Agricultural Engineering Lab**

AE.AST.80.01 Identify basic tools and measuring instruments used in an agricultural engineering lab.

**AE.AST.85 – Plan an agricultural engineering project.**

AE.AST.85.01 – Describe the drawing equipment needed to produce a scaled drawing of an agricultural engineering project.

AE.AST.85.02 – Apply design and drawing interpretation skills to determine methods and materials to be used in building an agricultural engineering project.

AE.AST.85.03 – Discuss tools, equipment and materials needed to construct the selected agricultural engineering project based upon price, availability and user expertise.

**Environmental and Natural Resources Management**

**AE.AST.90 – Apply conservation practices for water and soil in the environment.**

AE.AST.90.01 – Investigate water and its properties as it related to the production of food and fiber.

AE.AST.90.02 – Discuss soil as related to the production of food and fiber.

AE.AST.90.03 – Summarize equipment and tools related to soil/water management.

**AE.AST.95 – Analyze the conservation practices for utilizing forest, wildlife, fisheries and environmental resources.**

AE.AST.95.01 – Describe the types of tree species in the U.S. as related to their significance in the forestry industry.

AE.AST.95.02 – Describe equipment and tools utilized in the forest industry in the United States.

AE.AST.95.03 – Interpret wildlife management practices as related to good environmental stewardship.

AE.AST.95.04 – Compare types of production aquaculture systems and their utility in efficiently producing aquaculture food products.

AE.AST.95.05 – Discuss Integrated Pest Management as it applies to agricultural management.

**AE.AST.110 – Relate environmental practices to agricultural businesses.**

AE.AST.100.01 – Explain how to reduce effects of agricultural businesses on the environment.

AE.AST.100.02 – Identify optimal environmental conditions for agricultural businesses.