Course Title: 860 - Agriscience
Board Approval Date: November 17, 2020
Credit / Hours: 1.0 Credit / 126 hrs.

Course Description:

Agriscience focuses on a variety of agricultural topics using advancing technology. The class will cover the historical relevance of agriculture, natural resource management, and an introduction to the National FFA Organization, a student leadership organization. Additional topics will include animal and plant science systems as well as measuring skills and a study of emerging technology resources. This course is designed to help students discover their interests as they relate to agricultural courses as well as developing scientific skills and procedures. This course counts as a science credit toward graduation requirements and will count for the Ag General CIP 1.0000 scope and sequence.

Learning Activities / Modes of Assessment:

Unit Projects
Quizzes
Tests
Demonstrations & Presentations
Laboratory Experiment Analysis
Field Studies
Case Studies
Lab Reports
Technology
Group Projects

Instructional Resources:

Curriculum for Agricultural Science Education (CASE) National Curriculum: Introduction to Agriculture, Food, and Natural Resources (AFNR) **A. Barzydlo certified June 2013, B. Marsh certified July 2016.*
Online Resources
Lab Supplies & Equipment
Laboratory Specimens
Journal Articles
Assorted Textbooks - approved text materials for other agricultural courses are used for reference as appropriate

Curriculum: Agriculture General CIP 1.0000
Course: 860 - Agriscience

Know/Task:	Understand:	Do:
101 - Uses of Animals 103 - Animal Products 104 - External Anatomy of Animals 105 - Animal Body Systems 108 - Classes of Nutrients 110 - Animal Health and Safety 113 - Animal Technologies 115 - Feedstuffs Analysis 201 - Classification Systems 202 - Plant Components & Structures 204 - Plant Products & Uses 205 - Photosynthesis 207 - Impacts of Environmental Factors 212 - Plant Technologies 301 - Soil Formation 302 - Soil Characteristics 303 - Soil Sampling	Agriculture and natural resource systems provide the three basic human needs of food, clothing, and shelter Organization and record keeping are important to the success of an agricultural business natural resource management, science, business, communication, and leadership Production of agriculture commodities occurs within specific regions of the United States The National FFA Organization offers members many opportunities to build necessary employment and life skills, such as leadership, personal character, and career options Career Development Events (CDEs) expose students to numerous opportunities for academic application in agriculture Career opportunities exist in agriculture for all levels of education in the areas of production, processing, marketing, and regulation Agriculture is a broad field that encompasses many employment areas and offers a wide array of career opportunities	Determine if their basic needs are met after simulating the collection of resources during different situations Develop and keep an Agriscience Notebook to record and store information Interpret types of activities associated with agriculture from a case study about an agricultural entrepreneur Research top commodities produced in the United States and determine costs of food to consumers Explore educational and personal growth opportunities available through FFA membership Compare types of dress and the role professional dress plays in success Complete various components of ten Career Development Events Investigate the career opportunities available in agriculture Classify careers according to categories in agriculture

304 - Soil Test Analysis 307 - Soil Conservation & Management 308 - Soil Technologies 402 - Safety Rules 403 - Wear PPE 404 - Positive Safety Attitudes 406 - Data and Measurement Calculations 503 - Create SMART Goals 504 - Participate in FFA 505 - Leadership Skills 506 - Demonstrate Skills for Employment 507 - Research Careers in Agriculture 509 - Conduct Meetings (Parliamentary Procedure) 702 - Renewable vs. Non-renewable Natural Resources 703 - Point and Non-point Pollution 705 - Wildlife and Forestry Resources	Employability skills, such as work ethic, timeliness, communication, and self-direction, are essential attributes for a successful career Supervised Agricultural Experience (SAE) programs provide opportunities to explore potential career choices and develop professional career goals People utilize multiple forms of verbal and nonverbal communication Voice and use of visual aids are tools used in communicating effectively Speeches may be informative, persuasive, or special occasion People develop goals in order to achieve their dreams People utilize multiple forms of communication in their daily lives Parliamentary procedures are used to conduct orderly meetings Speaking and use of visual aids are tools used to communicate effectively Teamwork is essential when solving many problems and completing group tasks Laboratory equipment has specific uses in scientific experiments	Develop and maintain a career portfolio following a specific format Evaluate personal characteristics, strengths, and weaknesses Develop a Supervised Agricultural Experience (SAE) implementation plan Demonstrate verbal and non-verbal forms of communication in a charades-like game Prepare and present a formal introduction Practice effective public speaking characteristics Develop and present an informative speech Write a vision statement and develop personal goals Work collaboratively to complete team building challenges Use proper parliamentary procedures to voice an opinion Demonstrate the proper procedures for making a main motion and an amendment Develop and present a group PowerPoint presentation about agricultural careers to an audience Identify and describe the uses of common laboratory equipment

707 - Ecosystem Quality 801 - Biotech Impacts 802 - Application of Biotech 803 - Animal Biotech Issues 901 - Animal & Plant Food Sources 902 - Consumer Food Trends 903 - Food Handling 904 - Food Quality Assurance Practices 905 - Food Supply Industries 906 - Farm to Table	Reading and understanding laboratory procedures are essential to conducting a laboratory experiment safely Mass, volume, temperature, and density are common laboratory measurements Proper and accurate measurement is important for laboratory investigation Scientific method is a systematic process used to solve a problem The level of pH is used to determine the acidity and alkalinity of a substance The pH scale is 0-14 where 0 is extremely acidic, 7 is neutral, and 14 is extremely basic The level of pH affects the health and well-being of organisms Mineral matter, air, water, and organic matter are found in different proportions within a soil and define soil quality Mineral soils consist of three different particle sizes, specifically sand, silt, and clay Geographical features and environmental factors influence the formation process of soils and impact soil quality Soil erosion results in the loss of quality top soil and is a concern in the study of mineral soils	Measure distance, volume, mass, temperature, and density using the appropriate tools and scale Follow written procedures to complete a laboratory exercise Use equipment to collect data for an experiment Use a minimum of four science processes to design an experiment Perform a skit to demonstrate the science processes used in the experiment, laboratory safety, and group communication skills Determine if a substance is an acid or a base using LabQuest and a pH sensor Test the buffering ability of water and one additional substance Conduct and inquire lab on the effect of pH on plant health Write a lab report based on findings of the inquiry lab Conduct a sediment test to determine the particle sizes of the mineral matter and the presence of organic matter in a sample of soil Investigate the effects organic matter has on soil porosity and soil air holding capacity Conduct an investigation of soil deposition caused by water

	Sand, silt, and clay are three sizes of mineral particles that comprise soil texture Soil structure and soil texture are elements that affect soil function The texture, structure, and color of each layer of soil within a profile are used to identify specific horizons Soils form in layers that have distinguishing characteristics from other layers in a soil profile The water cycle is an example of a naturally occurring system in which the substance can change form and location Land topography influences the distribution of water and pollutants Water pollution is caused by point and non-point sources The quality of water sources, such as streams and drinking water, can be determined by measuring factors such as temperature, pH, turbidity, dissolved oxygen, and total dissolved solids Animal and plant cells have many similarities, especially in regards to cell function; however, there are important structural differences between the two cell types The nucleus of an animal and a plant cell is important for several life sustaining processes, such	Conduct tests to determine soil texture by feel Test soil permeability to understand the relationship between soil particle size and rate of water filtration Determine the texture, structure, and color of each horizon within a soil profile Play a game to simulate the journey of a drop of water through the water cycle Write and illustrate a story about what was learned regarding the journey a drop of water takes through the water cycle Conduct an experiment that models the flow of water over a landform Determine the spread of pollution from point and nonpoint sources. Perform tests to determine water quality using the factors of temperature, pH, turbidity, dissolved oxygen, and total dissolved solids Design and experiment determining the quality of drinking water and conduct the experiment to determine its validity Write a lab report regarding experimental findings. Identify and label the parts of a cell including each cell organelle function

	as cell division and protein synthesis DNA is genetic material that combined with protein comprises the chromosomes found inside animal and plant cell nuclei Genes are a combination of DNA segments that define animal and plant physical appearance Offspring of animals and plants derive their genetic traits from both parents Classification of people, places, and things is a basic skill used in daily life, scientific research, and the agricultural industry Objects can be classified based on their purpose, form, usefulness, and visual characteristics of anatomical or physiological similarities Dichotomous keys are a classification tool used to identify objects based on their physical features Ecosystems are an interaction between organisms and the environment in which the organisms live Energy flows from producers (plants) to consumers (animals) Plants and animals depend on each other for survival Food is derived from animal and plant products	Determine the differences in structural parts between an animal and plant cell Demonstrate the correct use of a microscope Prepare a microscope slide and identify the nucleus of an onion cell Extract the DNA bundles from strawberry tissue for observation Construct a DNA model and demonstrate how DNA replication happens in a cell Identify differences in physical features of people and trace their family traits Use mapping technology to organize thoughts Classify objects based on their physical characteristics Categorize animals by gender and species Develop a flowchart to classify 20 different tools Use a dichotomous key to identify ten types of trees Simulate the flow of energy in an ecosystem Conduct an experiment to determine the interdependence of plants and animals Complete a WebQuest researching an ecosystem

	Consumption trends of food have changed over time based on an increase of information about health issues and technological advances Food must be produced, transported, processed, and stored in a safe way There are many points where food can be contaminated while in route to the consumer Plants have roots, stems, leaves, and flowers, which are all vital to survival Flowers, consisting of four main parts, produce seeds for reproduction Seeds require moisture and warmth for germination Plants convert raw materials using the energy of the sun into sugar and oxygen Plant cells use water, oxygen, and glucose to produce energy and metabolic byproducts of carbon dioxide and water Production and management of plants are based upon environmental conditions, such as temperature Plants require adequate amounts of water for survival, growth, and development The three primary nutrients; nitrogen, phosphorus, and	Develop a model and poster depicting an ecosystem Record key points of ecosystems presented by classmates Document the plant and animal food products consumed in a twenty-four hour period Determine the percentage of plant and animal food products they consume Conduct an experiment to determine bacterial levels of meat samples when refrigerated, stored at room temperature, and cooked Observe and record growth of bacterial cultures Research the path a prepared food item takes from production to processing and present their findings to the class Solve a problem related to foodborne illness outbreak Identify and sketch the four basic plant parts Describe the functions of plant parts Construct a model depicting the parts of a complete flower Conduct a germination trial to determine the germination rate of bean seeds

	potassium, are necessary for the healthy growth of plants Body parts of animals vary among different species Production and management of animals are based on anatomical and physiological characteristics Animals are selected based upon the quality and correctness of anatomical structure and productive potential Animals have a complex set of systems that must work together Animals require food, shelter, and water for survival The nutrients needed by animals include protein, carbohydrates, fats, vitamins, minerals, and water and are found in many feed sources People depend on consumable forms of energy, such as fuel and electricity, which are used in everyday life Agricultural commodities can be converted to alternative energy sources Many renewable energy sources, such as wind, solar, and biofuels, are currently being used in the United States All property is legally defined and recorded based on a standardized regulatory system	Determine the presence of starch in plants that have received different light treatments Collect data on the rate of respiration and photosynthesis of plant leaves Determine the relationship between water availability and turgor pressure Calculate growing degree days for two locations to determine crop maturity Research plant macronutrients and record the functions in plants, deficiency symptoms, and sources for each Design and conduct an inquiry experiment on one environmental factor to investigate the optimal growth range for a plant Write a lab report and develop a presentation to report their findings from an inquiry experiment Study and learn the basic anatomical parts of an animal Develop a poster of the external anatomy of an animal that will be used to teach others Make decisions based on given priorities and criteria, and analyze objects as they compare ideal criteria Evaluate a class of market hogs based on specific priorities

	Global Positioning System (GPS) is a method used to determine an exact location of a point on the earth using a coordinate system based on longitude and latitude readings Applications of GPS and Geographic Information System are used in all disciplines of agriculture and natural resource systems to improve agricultural production efficiencies and environmental quality Agriculture plays an essential role in society and feeding the world	Make a concept map of the internal body systems and their relationships Research and identify the six essential nutrients and the functions of each Classify feedstuffs according to their nutrient value Compare the combustion of two common fuels used for energy production Describe parcels of land using the rectangular survey system and the metes and bounds system Use three points to triangulate a location Write a brief proposing a plan to be used at a presentation on solving world hunger

Pacing Guide

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Course Unit (Topic)	**Length of Instruction (Class Periods)**
Circles of Ag Education	8
Communication	6
Science of Agriculture	25
Biology of Agriculture (Natural Resources)	15
Plants and Animals	22
Agricultural Mechanics	8
Future of Agriculture	3
Final Exam Assessment	3
TOTAL DAYS	90