



School District of Marshfield Course Syllabus

Course Name: Exploring Agriscience

Grade(s): 7-8

Length of Course: Semester

Credit: 1/2 Credit

Program Goal:

The School District of Marshfield Agriculture Education Program will provide learners the opportunity to explore and develop interests in various areas of agriculture while preparing young adults for their next steps in life. Whether it is pursuing a postsecondary education or entering the world of work, Marshfield's agriculture program offers diverse experiences for all students in agriculture, horticulture and natural resources. Marshfield's agriculture program will provide valuable learning experiences for all learners whether they want to learn more about the importance of agriculture on society, have a hobby related to agriculture or are preparing for an agriculture related career.

Course Description:

Exploring Agriscience is a course in which learners investigate plants, animals, and the environment in a hands-on manner. Relevant topics range from the history of agriculture to Biotechnology, the future of agriculture. Learners will grow their own plants to take home and

learn about wildlife and their relationship to the environment. Students also have the opportunity to join FFA and participate in the club's many fun activities and competitions.

Wisconsin Standards for Agriculture, Food and Natural Resources (AFNR)	
Agriculture Business Standards (ABS)	
ABS3: Students will use record keeping to accomplish AFNR business objectives while complying with laws and regulations.	
Prepare and maintain all files needed to accomplish effective record keeping. ABS3.a	3.a.2.m: Maintain production and agribusiness records.
ABS4: Students will apply generally accepted accounting principles and skills to manage cash budgets, credit budgets and credit for AFNR businesses.	
Use accounting fundamentals to accomplish dependable bookkeeping and fiscal management. ABS4.a	4.a.2.m: Budget resources, as applied to the AFNR business, including capital, human, financial and time. 4.a.3.m: Identify financial concepts associated with production and profit.
Animal Systems (AS)	
AS1: Students will examine the components, historical development, global implications and future trends of the animal systems industry.	
Evaluate the development and implications of animal origin, domestication and distribution. AS1.a	AS1.a.4.m: Define major components of the animal industry.
AS2: Students will classify, evaluate, select and manage animals based on anatomical and physiological characteristics.	
Classify animals according to hierarchical taxonomy and agricultural use. AS2.a	2.a.3.m: Identify major animal species by common and scientific names.
AS4: Students will apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.	
Formulate feed rations to provide for the nutritional needs of animals. AS4.a	4.a.2.m: Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.
AS5: Students will evaluate and select animals based on scientific principles of animal production.	
Describe how selection and geographical regions impact the economic decisions of our livestock business. AS5.c	5.a.2.m: Explain the male and female reproductive organs of the major animal species.
Compare and contrast scientific methods associated with animal reproduction.	5.f.4.m: Explain the advantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.

AS5.f	
AS6: Students will prepare and implement animal handling procedures for the safety of animals, producers and consumers of animal products.	
Demonstrate safe animal handling and management techniques. AS6.a	6.a.2.m: Discuss the dangers involved in working with animals. 6.a.3.m: Explain the implications of animal welfare and animal rights for animal agriculture.
Implement procedures to ensure that animal products are safe. AS6.b	6.b.2.m: Identify animal production practices that could pose health risks or are considered to pose risks by some. 6.b.3.m: Describe how animal identification systems can track an animal's location, nutrition requirements, production progress and changes in health.
AS7: Students will select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.	
Design animal housing, equipment and handling facilities for the major systems of animal production. AS7.a	7.a.3.m: Identify equipment and handling facilities used in modern animal production.
AS8: Students will analyze environmental factors associated with animal production.	
Reduce the effects of animal production on the environment. AS8.a	8.a.2.m: Evaluate the effects of animal agriculture on the environment.
Biotechnology Systems (BT)	
BT1: Students will recognize the historical, social, cultural and potential applications of biotechnology.	
Distinguish major innovators, historical developments and potential applications of biotechnology in agriculture. BT1.a	1.a.3.m: Investigate current applications of biotechnology in agriculture.
Food Production and Processing (FPP)	
FPP2: Students will apply safety principles; recommend equipment and facility management techniques to the food products and processing industry.	
Manage operational procedures and create equipment and facility maintenance plans. FPP2.a	2.a.5.m: Develop a basic equipment and facility maintenance program.
Implement Hazard Analysis and Critical Control Point (HACCP) procedures to establish operating parameters. FPP2.b	2.b.3.m: Outline procedures to eliminate possible contamination hazards associated with food products and processing.
Apply safety and sanitation procedures in the handling, processing and storing of food products. FPP2.c	2.c.5.m: Evaluate food product handling procedures.
FPP4: Students will select and process food products for storage, distribution and consumption.	

Evaluate, grade and classify processed food products. FPP4.b	4.b.5.m: Discuss desirable qualities of fruit and vegetable products.
Process, preserve, package and present food and food products for sale and distribution. FPP4.c	4.c.8.m: Demonstrate how fresh foods are prepared for distribution.
Environmental Service Systems (ESS)	
ESS2: Students will apply scientific principles to environmental service systems.	
Apply soil science and microbiology principles to environmental service systems. ESS2.b	2.b.7.m: Explain the process of soil formation through weathering. 2.b.8.m: Describe the biodiversity found in soil and the contribution of biodiversity of the physical and chemical characteristics of soil. 2.b.9.m: Explain how the physical qualities of the soil influence the infiltration and percolation of water.
Apply hydrology principles to environmental service systems. ESS2.c	2.c.8.m: Demonstrate knowledge of hydrogeology by differentiating between ground and surface water.
Apply best management techniques associated with the properties, classifications and functions of wetlands. ESS2.d	2.d.7.m: Explain the importance of wetland management, creation, enhancement and restoration programs.
ESS3: Students will operate environmental service systems to manage a facility environment.	
Manage safe disposal of all categories of solid waste. ESS3.b	3.b.10.m: Define composts and composting.
Natural Resources (NR)	
NR1: Students will explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.	
Apply knowledge of natural resource components to the management of natural resource systems. NR1.a	1.a.3.m: Differentiate between renewable and nonrenewable natural resources. 1.a.4.m: Define ecosystem and related terms.
Classify natural resources. NR1.b	1.b.6.m: Describe morphological characteristics used to identify trees and other woody plants. 1.b.8.m: Compare and contrast wildlife species. 1.b.10.m: Demonstrate techniques used to identify rock, mineral and soil differences.
NR2: Students will apply scientific principles to natural resource management activities.	
Apply ecological concepts and principles to natural resource systems. NR2.d	2.d.12.m: Describe the processes associated with ecological succession. 2.d.14.m: Define invasive species along with pollution descriptions and delineation between point and nonpoint source pollutions with descriptions of climatic factors that influence natural resources.

NR3: Students will apply knowledge of natural resources to production and processing industries.	
Produce, harvest, process and use natural resource products. NR3.a	3.a.8.m: List tree species and describe related uses and harvesting methods. 3.a.14.m: Identify recreational uses of natural resources.
Plant Systems (PS)	
PS1: Students will apply knowledge of plant classification, anatomy and physiology to the production and management of plants.	
Classify agricultural plants according to taxonomy systems. PS1.a	1.a.6.m: Identify agriculturally important plants by common names.
Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems. PS1.b	1.b.4.m: Identify the components, the types and the functions of plant roots. 1.b.5.m: Identify the components and the functions of plant stems. 1.b.6.m: Discuss leaf morphology and the functions of leaves. 1.b.7.m: Identify the components of a flower, the functions of a flower and the functions of flower components. 1.b.8.m: Explain the functions and components of seeds and fruit and describe ways they may be carried through the environment.
Apply energy conversion to plant systems. PS1.c	1.c.3.m: Explain the basic process of photosynthesis and its importance to life on Earth. 1.c.4.m: Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.
Apply knowledge of plant physiology to plant systems. PS1.d	1.d.3.m: Compare and contrast monocot and dicot seed and plant growth characteristics. 1.d.4.m: Identify different types of plant growth regulators and forms of tropism.
PS2: Students will prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.	
Determine the influence of environmental factors on plant growth. PS2.a	2.a.4.m: Describe the effects air; temperature and water have on plant metabolism and growth. 2.a.5.m: Determine the optimal air, temperature and water conditions for plant growth.
Prepare growing media for use in plant systems. PS2.b	2.b.3.m: Identify the major components of growing media and describe how growing media support plant growth.
Develop and implement a fertilization plan for specific plants, field crops and/or greenhouse crops. PS2.c	2.c.3.m: Identify the essential nutrients for plant growth and development and their major functions and monitor plants for signs of nutrient deficiencies. 2.c.4.m: Adjust the pH of growing media. 2.c.6.m: Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations and describe different methods of fertilizer application.

PS3: Students will propagate, culture and harvest plants.	
Demonstrate plant propagation techniques. PS3.a	3.a.3.m: Explain pollination, cross-pollination and self-pollination of flowering plants. 3.a.4.m: Diagram the process of plant fertilization. 3.a.7.m: Describe optimal conditions for asexual propagation and demonstrate techniques used to propagate plants by cuttings, division, separation and layering. 3.a.8.m: Give examples of the risks and advantages associated with genetically modified plants.
Develop and implement a plant management plan for crop production. PS3.b	3.b.6.m: Prepare soil for planting with the addition of amendments. 3.b.9.m: Monitor the progress of plantings and determine the need to adjust environmental conditions.
Develop and implement a plan for integrated pest management. PS3.c	3.c.3.m: Identify types of plant pests and disorders. 3.c.7.m: Diagram the life cycles of major plant pests and diseases.
Apply principles and practices of sustainable agriculture to plant production. PS3.d	3.d.2.m: Describe sustainable agriculture practices and compare the ecological effects of traditional agricultural practices with those of sustainable agriculture.
Harvest, handle and store crops. PS3.e	3.e.3.m: Identify harvesting methods and harvesting equipment.
PS4: Students will employ elements of design to enhance an environment.	
Create designs using plants. PS4.a	4.a.3.m: Define design and identify design elements. 4.a.4.m: Discuss the applications of art in agriculture/horticulture.
PS5: Students will recognize different systems in which plants grow.	
Investigate various means to grow plants. PS5.a	5.a.2.m: Compare and contrast growing plants in soil versus growing plants in water.
Wisconsin Common Career Technical Standards (WCCTS)	
Career Development (CD)	
CD1: Students will consider, analyze and apply an awareness of self, identity and culture to identify skills and talents.	
Identify person strengths, aptitudes and passions. CD1.a	1.a.2.m: Assess personal strengths, aptitudes and passions related to potential future careers.
Demonstrate effective decision- making, problem solving and goal setting. CD1.b	1.b.3.m: Develop effective coping skills for dealing with problems. 1.b.4.m: Identify long and short- term goals.
Interact effectively with others in similar and diverse teams. CD1.c	1.c.5.m: Distinguish between appropriate and inappropriate behavior in a team setting. 1.c.6.m: Conduct oneself in a respectable manner which acknowledges the personal boundaries, rights and privacy of others.

	<p>1.c.7.m: Display cooperative behavior and identify personal strengths and assets in groups.</p> <p>1.c.8.m: Show respect and appreciation for individual and cultural differences in groups.</p>
<p>Apply a range of relevant decision-making strategies.</p> <p>CD1.d</p>	<p>1.d.3.m: Evaluate the positive and negative implications of personal decisions.</p> <p>1.d.4.m: Apply decision-making strategies to personal and team interactions.</p>
<p>CD2: Students will identify the connection between educational achievement and work opportunities in order to reach personal and career goals.</p>	
<p>Apply academic experiences to the world of work, inter-relationships and the community.</p> <p>CD2.a</p>	<p>2.a.1.m: Practice balancing school, studies, co-curricular activities, leisure time and family life.</p>
<p>CD3: Students will create and manage a flexible and responsive individualized learning plan to meet their career goals.</p>	
<p>Investigate the world of work in order to gain knowledge of self in order to make informed career decisions.</p> <p>CD3.a</p>	<p>3.a.5.m: Demonstrate the ability to use technology to retrieve and manage career information that inspires educational achievement.</p> <p>3.a.6.m: Build an ongoing awareness of personal abilities, skills, interests and motivation and determine how these fit with chosen career pathway.</p> <p>3.a.7.m: Develop an individual learning plan to enhance educational achievement and attain career goals based on a career pathway.</p> <p>3.a.8.m: Choose career opportunities that appeal to personal career goals.</p>
<p>Examine and evaluate opportunities that could enhance life and career plans and articulate plan to guide decisions and actions.</p> <p>CD3.b</p>	<p>3.b.3.m: Demonstrate openness to exploring a wide range of occupations and career pathways.</p>
<p>CD4: Students will identify and apply employability skills.</p>	
<p>Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.</p> <p>CD4.b</p>	<p>4.b.3.m: Use technology to assist in career exploration and job-seeking activities.</p>
<p>Leadership (LE)</p>	
<p>LE1: Students will apply leadership skills in real-world, family, community and business and industry applications.</p>	
<p>Implement leadership skills to accomplish team goals and objectives.</p> <p>LE1.a</p>	<p>1.a.7.m: Participate in civic and community leadership and teamwork opportunities to enhance skills to develop leadership potential.</p>
<p>Employ teamwork skills to achieve collective goals and use team members/ talents effectively.</p> <p>LE1.b</p>	<p>1.b.5.m: Demonstrate teamwork skills through working cooperatively with group members, group leader and others, both in the school and in the community, to achieve group objective.</p>

Identify the role of community service and service learning in family, community and business and industry. LE1.c	1.c.4.m: Select and develop a community service activity/event. 1.c.5.m: Show organizational skills necessary to be a successful leader and citizen and practice those skills in real-life situations.
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Key Vocabulary:			
aquaculture	biotechnology	breed	clay
cover crop	crop rotation	crossbred	cutting
deciduous	ecology	ecosystem	exports
farrowing	FFA	floriculture	food chain
forestry	genetic engineering	hydroponics	hardwood
imports	integrated pest management	legumes	livestock
loam	organic matter	pesticide	pests
phloem	photosynthesis	pistil	poultry
renewable	SAE	soil horizon	stamen
wetland	xylem	taproot	fibrous root

Topics/Content Outline- Units and Themes:

Content Outline:

- The History of World Agriculture
 - U.S. Agricultural Exports and Imports
 - Wisconsin's Rank in the Nation in Agricultural Products
 - World Distribution of Agricultural Products
 - History of U.S. Agriculture
- Agricultural Leadership
 - Agricultural Careers
 - Local and State FFA Activities
 - National and International FFA Activities
 - Develop Supervised Agricultural Experience
- Soil: The Origin of Life
 - Soil Formation
 - Soil Horizons
 - Soil Texture
 - Soil pH
- Plant Production
 - Plant Structures and their Uses

- Agricultural Pests
- Floriculture
- Nursery Production
- Landscape Design
- Fruit and Nut Production
- Row Crops
- Natural Resources
 - Forest Science
 - Wildlife Management
 - Protection of Soils and Water
- Animal Science
 - The Livestock Industry
 - The Dairy Industry
 - The Poultry Industry
 - The Science of Aquaculture
 - Companion Animals
 - The Ethical Treatment of Animals
- Biotechnology: The Future of Agriculture

Primary Resource(s):

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