Golden Standards- Barron Agricultural Education- Horticulture

Overall- the Agricultural Education Program Standards – as stated by DPI-Ag/Natural Resources Team are to:

- to prepare students for careers in the agriculture industry;
- to support students in their career choices;
- to develop leadership skills in students to benefit their community and the food, fiber, and natural resource systems; and
- To develop premier leadership, personal growth and career success through agricultural education.

Common Career & Technical Standards- applied to all pathways within AFNR offerings at BHS

Students will be able to:

Content Area: 4C/Creativity, Critical Thinking, Communication and Collaboration

Standard: 4C1: Students will think and work creatively to develop innovative solutions to problems and opportunities.
Standard: 4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.
Standard: 4C3: Students will communicate and collaborate with others to accomplish tasks and develop solutions to problems and opportunities.

Content Area: CD/Career Development

Standard: CD1: Students will consider, analyze and apply an awareness of self, identity and culture to identify skills and talents.
Standard: CD2: Students will identify the connection between educational achievement and work opportunities in order to reach personal and career goals.
Standard: CD4: Students will identify and apply employability skills.

Content Area: LE/Leadership

Standard: LE1: Students will apply leadership skills in real-world, family, community and business and industry applications.

Content Area: IMT/Information, Media and Technology Skills

Standard: IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.

Specific Content Areas

Plant Science Pathway

Courses included: Horticulture, Backyard Plant Design/Landscaping, Plants, Animals & You

Class: Horticulture

**Class is also crosswalked with WI Science Standards, and counts for alternative science credit.*

*** CCTS and IMT standards listed above are included in this course.*

Golden Standard- *WI Agriculture,Food & Natural Resource Standards -2014* **AFNR Standard**	**Maroon Standard** **AFNR- Learning Priority**	**AFNR Performance Indicator/ What does it look like**	**Assessment** ***How will I know if students learned the information***
• **Content Area: 4C/Creativity, Critical Thinking, Communication and Collaboration** • **Content Area: CD/Career Development** • **Content Area: LE/Leadership**	**Participating in FFA & SAE events**	• Students will participant in relevant SAE and FFA leadership opportunities. See above for CCTS, Career Development, Leadership, and Instructional Media Standards	FFA CAreer Development Events -Milk & Dairy Foods Evaluation -Meats Technology & Evaluation -Food Science & Technology CDE SAE - RElated awards--Degrees -Proficiency applications in related areas

Standard: PS1: Students will apply knowledge of plant classification, anatomy and physiology to the production and management of plants.	PS1.a: Classify agricultural plants according to taxonomy systems.	● PS1.a.7.h: Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons. ● PS1.a.8.h: Describe the morphological characteristics used to identify agricultural plants. ● PS1.a.9.h: Identify agriculturally important plants by scientific names.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports
	PS1.b: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.	● PS1.b.9.h: Compare and contrast mitosis and meiosis and apply the knowledge of cell differentiation and the functions of the major types of cells to plant systems. ● PS1.b.10.h: Identify root tissues and explain the pathway of water and nutrients into and through the root tissues. ● PS1.b.11.h: Relate the active and passive transport of minerals into and through the vascular system to plant nutrition. ● PS1.b.12.h: Describe and apply the processes of translocation to the management of plants. ● PS1.b.13.h: Explain how leaves capture light energy and allow for the exchange of gases. ● PS1.b.14.h: Identify the different types of flowers and flower forms and apply the	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports

		knowledge of flower structures to plant breeding, production and use. ● PS1.b.15.h: Apply the knowledge of seed and fruit structures to plant culture and use. ●	
	PS1.c: Apply energy conversion to plant systems.	● PS1.c.3.m: Explain the basic process of photosynthesis and its importance to life on Earth. ● PS1.c.4.m: Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis. ● PS1.c.5.h: Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management. ● PS1.c.6.h: Explain cellular respiration and its importance to plant life. ● PS1.c.7.h: Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration. ● PS1.c.8.h: Explain the four stages of aerobic respiration and relate cellular respiration to plant growth, crop management and post-harvest handling. ● ●	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports

	PS1.d: Apply knowledge of plant physiology to plant systems.	● PS1.d.3.m: Compare and contrast monocot and dicot seed and plant growth characteristics. ● PS1.d.4.m: Identify different types of plant growth regulators and forms of tropism. ● PS1.d.5.h: Define primary growth and the role of the apical meristem. ● PS1.d.6.h: Explain the process of secondary plant growth. ● PS1.d.7.h: Relate the principles of primary and secondary growth to plant systems. ● PS1.d.8.h: Identify the five groups of naturally occurring plant hormones and synthetic plant growth regulators. ● PS1.d.9.h: Identify the plant responses to plant growth regulators and different forms of tropism. ● PS1.d.10.h: Select plant growth regulators to produce desired responses from plants.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports
Standard: PS2: Students will prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.	PS2.a: Determine the influence of environmental factors on plant growth.	● PS2.a.6.h: Describe plant responses to light color, intensity and duration. ● PS2.a.7.h: Evaluate plant responses to varied light color, intensity and duration. ● PS2.a.8.h: Design, implement and evaluate a plan to maintain optimal conditions for plant growth.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips

		● ●	-Lab activities and lab reports
	● PS2.b: Prepare growing media for use in plant systems.	● PS2.b.3.m: Identify the major components of growing media and describe how growing media support plant growth. ● PS2.b.4.m: Compare and contrast different plant medias. ● PS2.b.5.h: Describe the physical characteristics of growing media and explain the influence they have on plant growth. ● PS2.b.6.h: Formulate and prepare growing media for specific plants or crops. ● PS2.b.7.h: Identify the categories of soil water. ● PS2.b.8.h: Discuss how soil drainage and water-holding capacity can be improved. ● PS2.b.9.h: Determine the hydraulic conductivity for soil and how the results influence irrigation practices. ● ●	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports
	PS2.c: Develop and implement a fertilization plan for specific plants, field crops and/or greenhouse crops.	● PS2.c.5.m: Collect soil and plant tissue samples for testing and interpret the test results. ● PS2.c.6.m: Identify fertilizer sources of essential plant nutrients, explain fertilizer	-Written & oral quizzes & exams -In class activities, demonstrations, simulations

		formulations and describe different methods of fertilizer application. ● PS2.c.7.h: Describe nutrient deficiency symptoms, recognize environmental causes of nutrient deficiencies and prepare a scouting report. ● PS2.c.8.h: Discuss the influence of pH and cation exchange capacity on the availability of nutrients. ● PS2.c.9.h: Contrast pH and cation exchange capacity between mineral soil and soilless growing media. ● PS2.c.10.h: Determine the nutrient content of soil using appropriate laboratory procedures and prescribe fertilization based on results. ● PS2.c.11.h: Determine the nutrient content of plant tissue samples using appropriate laboratory procedures and prescribe fertilization based on results. ● PS2.c.12.h: Calculate the amount of fertilizer to be applied and calibrate equipment to apply the prescribed amount of fertilizer. ● PS2.c.13.h: Use variable-rate technology to apply fertilizers to meet crop nutrient needs.	-Field trips -Lab activities and lab reports

Standard: PS3: Students will propagate, culture and harvest plants.	PS3.a: Demonstrate plant propagation techniques.	● PS3.a.6.m: Handle seed to overcome seed dormancy mechanisms and to maintain seed viability and vigor. ● PS3.a.7.m: Describe optimal conditions for asexual propagation and demonstrate techniques used to propagate plants by cuttings, division, separation and layering. ● PS3.a.8.m: Give examples of the risks and advantages associated with genetically modified plants. ● PS3.a.9.h: Demonstrate proper procedures in budding or grafting selected materials. ● PS3.a.10.h: Evaluate asexual propagation practices based on productivity and efficiency. ● PS3.a.11.h: Define micropropagation, discuss advantages associated with the practice and outline the four main stages of the process. ● PS3.a.12.h: Propagate plants by micropropagation using aseptic techniques. ● PS3.a.13.h: Explain the principles behind recombinant DNA technology and the basic steps in the process. ● PS3.a.14.h: Evaluate the performance of genetically modified crops.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports

	PS3.b: Develop and implement a plant management plan for crop production.	● PS3.b.10.h: Inspect propagation material for evidence of pests or disease. ● PS3.b.11.h: Produce pest- and disease-free propagation material. ● PS3.b.12.h: Operate mechanized planting equipment. ● PS3.b.13.h: Prepare and implement a plant production schedule based on predicted environmental conditions. ● PS3.b.14.h: Explain the reasons for controlling plant growth. ● PS3.b.15.h: Demonstrate proper techniques to control and manage plant growth through mechanical, cultural or chemical means. ● PS3.b.16.h: Create and implement a plan to control and manage plant growth.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports
	PS3.c: Develop and implement a plan for integrated pest management.	● PS3.c.7.m: Diagram the life cycles of major plant pests and diseases. ● PS3.c.8.h: Predict pest and disease problems based on environmental conditions and life cycles. ● PS3.c.9.h: Describe pest control strategies associated with integrated pest management. ● PS3.c.10.h: Describe types of pesticide controls and formulations. ● PS3.c.11.h: Employ pest management strategies to manage pest populations,	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Lab activities and lab reports

		assess the effectiveness of the plan and adjust the plan as needed. ● PS3.c.12.h: Explain risks and benefits associated with the materials and methods used in plant pest management. ● PS3.c.13.h: Explain procedures for the safe handling, use and storage of pesticides. ● PS3.c.14.h: Evaluate environmental and consumer concerns regarding pest management strategies.	
	PS3.d: Apply principles and practices of sustainable agriculture to plant production.___	● PS3.d.3.h: Prepare and implement a plan for an agricultural enterprise that involves practices in support of sustainable agriculture.	
	PS3.e: Harvest, handle and store crops.	● PS3.e.9.h: Explain reasons for calculating crop yield and loss. ● PS3.e.10.h: Evaluate crop yield and loss data. ● PS3.e.11.h: Implement plans to reduce crop loss. ● PS3.e.12.h: Explain the proper conditions to maintain the quality of plants and plant products held in storage. ● PS3.e.13.h: Monitor environmental conditions in storage facilities for plants and plant products.	-Written & oral quizzes & exams -In class activities, demonstrations, simulations -Field trips -Lab activities and lab reports

		● PS3.e.14.h: Evaluate techniques for grading, handling and packaging plants and plant products.	
Standard: PS5: Students will recognize different systems in which plants grow.	PS5.a: Investigate various means to grow plants.	● PS5.a.3.h: Compare and contrast various plant growing systems including, but not limited to greenhouse, hydroponics, and aquaponics.	-Establish hydroponic system for producing food for school lunch program.