Learning that works for Washington CTE™

Updated 1.2017

JH Agriscience

Course: Junior High Agriscience		**Total Framework Hours: 62 hours**
CIP Code:	☒**Exploratory** ☐**Preparatory**	**Date Last Modified: April 1, 2021**
Career Cluster: Agriculture, Food and Natural Resources		**Cluster Pathway: Animal, Plant and Natural Resource Systems**

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COMPONENTS AND ASSESSMENTS

Performance Assessments:

1. Research and compare the different sciences that contribute to agriscience and their role in our everyday lives.
2. Understand the role of agriscience in our everyday lives and how to support in the future.
3. Identify major technological changes in agriculture production in the United States.
4. Identify and describe the basic and applied sciences that relate to agriscience.
5. Create a timeline on the history of American agriculture production and technology.
6. Develop personal objectives by applying knowledge of leadership skills and opportunities available in the National FFA Organization.

Leadership Alignment:

21st Century Skills

4.B.2. Manage the flow of information from a wide variety of sources

FFA First Year Members CDE - examine the history of the National FFA Association and agricultural production.

Standards and Competencies

Unit 1: Role of Agriscience and FFA

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 8**

·PS.03.04. Apply principles and practices of sustainable agriculture to plant production.

- PS.03.04.01.a. Compare and contrast the alignment of different production systems with USDA sustainable practices criteria.
- PS.03.04.01.b. Analyze the alignment of modern technologies used in production systems with USDA sustainable practices criteria.
- PS.03.04.02.a. Summarize national/international and local/regional food production systems.

·PS.03.05. Harvest, handle and store crops according to current industry standards.

- PS.03.05.01.a. Identify and summarize harvesting methods and equipment.
- PS.03.05.04.a. Identify and categorize plant preparation methods for storing and shipping plants and plant products.
- PS.03.05.05.a. Summarize the reasons for preparing plant products for distribution.

Aligned Washington State Learning Standards

Arts	

Computer Science	
Educational Technology	1.3 Investigate and think critically, research, manage and evaluate information and solve problems using digital tools and resources. ● 1.3.2. Locate and organize information from a variety of sources of media.
English Language Arts	CCSS.ELA-LITERACY.RHST.6-8.2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	
Science	
Social Studies	4.2.3. Understands and analyzes how technology and ideas have impacted U.S. history (1776— 1900).

COMPONENTS AND ASSESSMENTS

Performance Assessments:

1. Classify agricultural plants based on their taxonomy systems
2. Diagram the major parts of a plant and describe their function
3. Apply knowledge of plant needs to create a beneficial environment
4. Test a hypothesis and collect data on plant responses under a variety of environmental conditions
5. Diagram a typical plant cell and identify plant cell organelles and their functions
6. Compare and contrast plant and animal cells
7. Explain the process of Mitosis and describe the purpose of cell division
8. Apply knowledge of plant reproduction to grow and maintain a variety of plants
9. Examine the photosynthesis process and describe how plants take in the necessary components to make their own food
10. Examine the cellular respiration process and its importance to plant and animal life on Earth
11. Apply knowledge of photosynthesis and cellular respiration to identify the products and by-products released into the environment
12. Select an area of agriculture interest and maintain an SAE record book on the AET online system.

Leadership Alignment:

21st Century Skills

1.B.2. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
3.B.1. Demonstrate ability to work effectively and respectfully with diverse teams
3.B.3. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
8.B.1. Monitor, define, prioritize and complete tasks without direct oversight

Standards and Competencies

Unit 2: Plant Science and SAE

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 20**

AFNR – Plant Systems Standards

· PS.01.03. Develop and implement a fertilization plan for specific plants or crops.

- PS.01.03.01.a. Identify the essential nutrients for plant growth and development and their major functions.
- PS.01.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report to correct elements negatively affecting plant growth in a field or greenhouse.
- PS.01.03.03.a. Collect soil and plant tissue samples using generally accepted procedures and explain how incorrect sample collection will affect the results of a laboratory analysis.
- PS.01.03.03.b. Interpret laboratory analysis of soil and tissue samples.
- PS.01.03.03.c. Prescribe fertilizer applications based on the results of a laboratory analysis of soil and plant tissue samples.

· PS.02.02. Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.

- PS.02.02.02.a. Identify and summarize the components, the types and the functions of plant roots.
- PS.02.02.03.a. Identify and summarize the components and the functions of plant stems.
- PS.02.02.03.c. Evaluate the function of the xylem, phloem, and cambium tissues and the impact on plant systems.
- PS.02.02.04.a. Research and summarize leaf morphology and the functions of leaves.
- PS.02.02.04.b. Analyze how leaves capture light energy and summarize the exchange of gases.
- PS.02.02.05.a. Identify and summarize the components of a flower, the functions of a flower and the functions of flower components.
- PS.02.02.05.b. Apply knowledge of flower structure to differentiate between the types of flowers and flower inflorescence.
- PS.02.02.06.a. Identify and summarize the functions and components of seeds and fruit.

· PS.02.03. Apply knowledge of plant physiology and energy conversion to plant systems.

- PS.02.03.01.a. Summarize the importance of photosynthesis to plant life on earth and the process of photosynthesis, including the types, its stages, and its products and by-products.
- PS.02.03.02.a. Summarize the stages of cellular respiration including their products and by-products.
- PS.02.03.05.a. Compare and contrast the effects of transpiration, translocation and assimilation of plants.

·PS.03.01. Demonstrate plant propagation techniques in plant system activities.

- PS.03.01.02.a. Demonstrate sowing techniques for providing favorable conditions to meet the factors of seed germination.

Aligned Washington State Learning Standards	
Arts	
Computer Science	
Educational Technology	
English Language Arts	CCSS.ELA-LITERACY.RHST.6-8.3. Follow precisely a multistep procedure from carrying out experiments, taking measurements, or performing technical tasks. CCSS.ELA-LITERACY.RHST.6-8.9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. CCSS.ELA-LITERACY.WHST.6-8.1.b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible resources. CCSS.ELA-LITERACY.WHST.6-8.1.e. Provide a concluding statement or section that follows from and supports the argument presented.
Environment & Sustainability	

Financial Education	
Health and Physical Education	
Mathematics	8EE. Expressions and equations -Work with radical and integer components. -Understand the connections between proportional relationships, lines and linear equations.
Science	MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.
Social Studies	

COMPONENTS AND ASSESSMENTS

Performance Assessments:

1. Classify animals based on their basic taxonomic classification
2. Examine and describe animal systems and their function
3. Explain how the anatomy and physiology of an animal relates to their production and use
4. Diagram the flow of energy in an ecosystem between living organisms
5. Identify the three main nutrients that provide for the nutritional needs of animals
6. Examine a variety of feedstuff and record the important nutritional components
7. Prescribe a treatment plan for nutrient deficiencies
8. Analyze and compare a variety of feedstuff and the rations needed to maintain animal nutritional requirements
9. Demonstrate knowledge of animal nutrition by conducting an experiment on an unknown feed source and evaluating its nutritional value
10. Explain the purpose and benefits of feed additives
11. Examine the principles of genetic inheritance in animals
12. Analyze the differences between natural and artificial reproduction methods
13. Evaluate male and female reproductive organs when selecting animals
14. Explain the advantages of using genetically superior animals in production of animals and food products
15. Select animals based on breeding and production characteristics

Leadership Alignment:

21st Century Skills

3.A.1. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
3.A.4. Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
4.A.1. Access information efficiently and effectively
10.B.1.b. Manage time and projects effectively
FFA Livestock Judging CDE – evaluate livestock for market and breeding purposes.

Standards and Competencies

Unit 3: Animal Science

Industry Standards and/or Competencies	**Total Learning Hours for Unit: 19**

AFNR – Animal Systems Standards

·AS.03.01. Analyze the nutritional needs of animals.

- AS.03.01.01.a. Identify and summarize essential nutrients required for animal health and analyze each nutrients role in growth and performance.
- AS.03.01.01.b. Differentiate between nutritional needs of animals in different growth stages and production systems.
- AS.03.01.02.a. Differentiate between nutritional needs of animal species.
- AS.03.01.02 b. Correlate a species nutritional needs to feedstuffs that could meet those needs.

·AS.03.02. Analyze feed rations and assess if they meet the nutritional needs of animals.

- AS.03.02.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.
- AS.03.02.01.b. Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.

·AS.03.03. Utilize industry tools to make animal nutrition decisions.

- AS.03.03.02.a. Examine and summarize the meaning of various components of feed labels and feeding directions.

·AS.04.02. Apply scientific principles to select and care for breeding animals.

- AS.04.02.01.a. Summarize genetic inheritance in animals.
- AS.04.02.02.a. Identify and summarize inheritance and terms related to inheritance in animal breeding.
- AS.04.02.02.b. Demonstrate how to determine probability trait inheritance in animals.
- AS.04.02.04.a. Identify and summarize different needs of breeding animals based on their growth stages.

·AS.04.03. Apply scientific principles to breed animals.

- AS.04.03.01.a. Identify and categorize natural and artificial breeding methods.
- AS.04.03.02.a. Analyze the materials, methods and processes of artificial insemination.

·AS.06.02. Apply principles of comparative anatomy and physiology to uses within various animal systems.

- AS.06.02.01.a. Research and summarize characteristics of a typical animal cell and identify the organelles.
- AS.06.02.02.a. Examine the basic functions of animal cells in animal growth and reproduction.

·AS.06.03. Select and train animals for specific purposes and maximum performance based on anatomy and physiology.

- AS.06.03.01.a. Identify and summarize how an animal's health can be affected by anatomical and physiological disorders.

·AS.07.01. Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.

- AS.07.01.02.a. Explain methods of determining animal health and disorders.
- AS.07.01.03.a. List and summarize the characteristics of wounds, common diseases, parasites and physiological disorders that affect animals.
- AS.07.01.03.b. Identify and describe common illnesses and disorders of animals based on symptoms and problems caused by wounds, diseases, parasites and physiological disorders.

Aligned Washington State Learning Standards	
Arts	(VA:Cr2.3.8) a. Select, organize, and design images and words to make visually clear and compelling presentations
Computer Science	
Educational Technology	1.3 Investigate and think critically, research, manage and evaluate information and solve problems using digital tools and resources. ● 1.3.3. Analyze, synthesize and ethically use information to develop a solution, make informed decisions and report results. 2.3 Select and use applications, use productivity tools and common applications effectively and constructively.

	● 2.3.2. Select and use online applications.
English Language Arts	CCSS.ELA-LITERACY.WHST.6-8.8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	8EE. Expressions and equations -Work with radical and integer components. -Understand the connections between proportional relationships, lines and linear equations.
Science	MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. MS-LS 1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. MS-LS4-5. Gather and synthesize information about technologies that have changed the way humans influence the inheritance of desired traits in organisms.
Social Studies	

COMPONENTS AND ASSESSMENTS	
Performance Assessments: 1. Identify the natural resources available in an ecosystem 2. Analyze the effect that living organisms can have on natural resources and other living organisms 3. Diagram the cycling of matter in an ecosystem and the affects that human activity can have on the availability of natural resources 4. Identify different factors related to stream health and evaluate improvements applied to local streams 5. Identify the characteristics of healthy forest land and assess the methods used to improve a forest stand 6. Identify population growth of local wildlife and determine their effect on local resources to develop an improvement plan	
Leadership Alignment: 21st Century Skills 1.B.2. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work. 2.B.1. Analyze how parts of a whole interact with each other to produce overall outcomes in complex system. 2.C.4. Interpret information and draw conclusions based on the best analysis. FFA Environmental/Natural Resource CDE – practice identification of species and Water Analysis and Waste Management practicums using standards.	
Standards and Competencies	
Unit 4: Natural Resource Science	
Industry Standards and/or Competencies	**Total Learning Hours for Unit: 15**
AFNR – Natural Resource Systems Standards ·NRS.01.01. Apply methods of classification to examine natural resource availability and ecosystem function in a particular region.	

- NRS.01.01.01.a. Summarize and classify the different kinds of natural resources using common classification schemes.
- NRS.01.01.02.a. Summarize the components that compromise all ecosystems.
- NRS.01.01.02.b. Analyze the interdependence of organisms within an ecosystem and assess the dependence of organisms on nonliving components.

·NRS.01.03. Apply ecological concepts and principles to atmospheric natural resource systems.

- NRS.01.03.01.a. Classify different kinds of biogeochemical cycles and the role they play in natural resources systems.

·NRS.02.02. Assess the impact of human activities on the availability of natural resources.

- NRS.02.02.01.a. Summarize the relationship between natural resources, ecosystems and human activity.
- NRS.02.02.01.b. Assess and explain how different kinds of human activity affect the use and availability of natural resources.

·NRS.04.01. Demonstrate natural resource protection, maintenance, enhancement and improvement techniques.

- NRS.04.01.01.a. Identify and categorize different kinds of streams.
- NRS.04.01.01.b. Assess and explain indicators of the biological health of a stream.
- NRS.04.01.02.a. Identify and categorize characteristics of a healthy forest.
- NRS.04.01.02.b. Assess and apply the methods used to improve a forest stand.
- NRS.04.01.03.a. Identify and categorize characteristics of a healthy wildlife habitat.
- NRS.04.01.03.b. Assess and apply methods of wildlife habitat improvement.
- NRS.04.01.03.c. Devise a comprehensive improvement plan for a wildlife habitat.

Aligned Washington State Learning Standards

Arts	
Computer Science	
Educational Technology	
English Language Arts	
Environment & Sustainability	
Financial Education	
Health and Physical Education	
Mathematics	8F. Functions -Define, evaluate and compare functions -Use functions to monitor relationships between quantities 8SP. Statistics and Probability -Investigate patterns of association in bivariate data
Science	MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Social Studies	

The 21st Century Skills should be taught and assessed throughout the course.This table should be included at the end of this document.

21st Century Skills		
Check those that students will demonstrate in this course:		
LEARNING & INNOVATION **Creativity and Innovation** ☐Think Creatively ☒Work Creatively with Others ☐Implement Innovations **Critical Thinking and Problem Solving** ☐Reason Effectively ☒**U**se Systems Thinking ☒Make Judgments and Decisions ☐Solve Problems **Communication and Collaboration** ☒Communicate Clearly ☒Collaborate with Others	**INFORMATION, MEDIA & TECHNOLOGY SKILLS** **Information Literacy** ☒Access and /evaluate Information ☐Use and Manage Information **Media Literacy** ☐Analyze Media ☐Create Media Products **Information, Communications and Technology (ICT Literacy)** ☐Apply Technology Effectively	**LIFE & CAREER SKILLS** **Flexibility and Adaptability** ☐Adapt to Change ☐Be Flexible **Initiative and Self-Direction** ☐Manage Goals and Time ☒Work Independently ☐Be Self-Directed Learners **Social and Cross-Cultural** ☐Interact Effectively with Others ☐Work Effectively in Diverse Teams **Productivity and Accountability** ☐Manage Projects ☒Produce Results **Leadership and Responsibility** ☐Guide and Lead Others ☐Be Responsible to Others