

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

ANIMAL SCIENCE

Date: January 2017

Proposed Grade Level(s): 11th - 12th

Grading: A-F

CTE Sector / Pathway: Agriculture & Natural Resources/Animal Science

Prerequisite(s): Integrated Math 1, Passing Grade in Ag Bio and Ag Chem or teacher approval

Intent to Pursue 'A-G' College Prep Status: Yes

Course Length: 1 Year

Subject Area: Career Technical Education

Credits: 5 per semester

COURSE DESCRIPTION:

This course will provide the student with principles in Animal Sciences along with Anatomy and Physiology focusing on the areas of mammalian production, anatomy, physiology, reproduction, nutrition, respiration, and genetics. This course is intended to successfully prepare students for entry level employment in animal science careers after high school, as well as those students who plan on majoring in Agricultural Sciences at a post-secondary institution. Throughout the course, students will be graded on participation in intra-curricular Future Farmers of America (FFA) activities, as well as the development and maintenance of an ongoing Supervised Agricultural Experience (SAE) program and use of their online FFA Record Book account.

GENERAL GOALS/ESSENTIAL QUESTIONS:

Goals:

- Students will explore the process of animal domestication and the economic impact of animal agriculture in regards to society and human health.
- Students will delve into the nomenclature surrounding animal agriculture and apply biology concepts of animal cells, amino acids, protein synthesis, and natural selection to the life cycles of animals.
- Students will explore the parts of the musculoskeletal system, as well as how the parts work together, and apply this knowledge to selecting and evaluating livestock.
- Students will explore the processes of animal reproduction including estrous and estrus, gestation cycles, hormones, parturition, anatomy, artificial insemination, and embryo transplantation.
- Students will explore the processes of mitosis and meiosis and the principles of inheritance, and apply them to livestock breeding decisions.
- Students will compare and contrast monogastric and ruminant digestive systems in regards to anatomy, efficiency, and digestive processes.
- Students will classify nutrients and explore the nutrient requirements of different species of livestock.
- Students will explore the anatomy and physiology of the nervous system and investigate common neurological disorders in animal agriculture.
- Students will explore the anatomy and physiology, as well as the function of both the respiratory system and the cardiovascular systems of animals
- Students will explore the role of the integumentary system, as well as compare and contrast the physiology of lactation and mammary glands in different species.
- Students will explore the principles of animal health including prevention, treatment, and eradication of disease.

Essential Questions:

- Can students analyze the production demographics of different regions, methodologies for producing livestock, and the role hormones play in production?
- Are students able to apply biology concepts to the life cycles of animals, including gestation, parturition and post-parturition?
- Do students successfully apply principles of skeletal conformity, muscle volume, fat deposition, productivity and performance to the evaluation of livestock?
- Can students identify and evaluate the processes of animal reproduction including estrous and estrus, gestation cycles, hormones, parturition, anatomy, artificial insemination, and embryo transplantation?
- Can students apply Inheritance theory to livestock breeding decisions through the in-depth evaluation of dominant and recessive genes, complex inheritance patterns, and investigating mutations?
- Are students able to compare and contrast monogastric and ruminant digestive systems in regards to anatomy, efficiency, feeding requirements, and digestive processes?
- Are students able to classify nutrients and explore the nutrient requirements of different species of livestock?
- Can students successfully balance feed rations and devise feeding plans to optimize animal growth?
- Can students identify and explain the anatomy and physiology of the nervous system, as well as research and report common neurological disorders that are an issue in animal agriculture?
- Can students identify, explain, and analyze the anatomy and physiology, as well as the function of both the respiratory system and the cardiovascular system of livestock species?
- Are students able to successfully perform dissections of various animal organs and body systems?
- Can students compare and contrast the physiology of lactation and mammary glands in different livestock species?
- Can students successfully conduct research and create a report about the principles of animal health including prevention, treatment, and eradication of disease?
- Can students successfully conduct research and create a report on the role of preventative measures including sanitation, vaccination, and other animal husbandry techniques?

COMMON CORE STATE ANCHOR STANDARDS FOR READING (K-12):

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Reading Range / Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

COMMON CORE STATE ANCHOR STANDARDS FOR WRITING (K-12):

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

COMMON CORE STATE ANCHOR STANDARDS FOR SPEAKING AND LISTENING (K-12):

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and ensure that the organization, development, and style are appropriate to task, purpose, and audience.
5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

CA STANDARDS FOR CAREER READY PRACTICE

1. Apply appropriate technical skills and academic knowledge.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and other work-related practices.

2. Communicate clearly, effectively, and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others, are active listeners who speak clearly and with purpose, and are comfortable with the terminology common to the workplace environment. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.

3. Develop an education and career plan aligned with personal goals.

Career-ready individuals take personal ownership of their own educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process and understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.

4. Apply technology to enhance productivity.

Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.

5. Utilize critical thinking to make sense of problems and persevere in solving them.

Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve the problem and, once agreed upon, follow through to ensure the problem is resolved.

6. Practice personal health and understand financial literacy.

Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.

7. Act as a responsible citizen in the workplace and the community.

Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them and think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.

8. Model integrity, ethical leadership, and effective management.
Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.
9. Work productively in teams while integrating cultural and global competence.
Career-ready individuals positively contribute to every team as both team leaders and team members. They apply an awareness of cultural differences to avoid barriers to productive and positive interaction. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.
10. Demonstrate creativity and innovation.
Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.
11. Employ valid and reliable research strategies.
Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.
12. Understand the environmental, social, and economic impacts of decisions.
Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization. Note: As stated previously, California's Standards for Career Ready Practice

CTE KNOWLEDGE AND PERFORMANCE ANCHOR STANDARDS:

- 1.0 – Academics: Students understand the academic content required for entry into post-secondary education and employment in the Agriculture and Natural Resources sector.
- 2.0 – Communications: Students understand the principles of effective oral, written, and multimedia communication in a variety of formats and contexts.
- 3.0 – Career Planning and Management: Students understand how to make effective decisions, use career information, and manage personal career plans.
- 4.0 – Technology: Students know how to use contemporary and emerging technological resources in diverse and changing personal, community, and workplace environments.
- 5.0 – Problem Solving and Critical Thinking: Students understand how to create alternative solutions by using critical and creative thinking skills, such as logical reasoning, analytical thinking, and problem-solving techniques.
- 6.0 – Health and Safety: Students understand health and safety policies, procedures, regulations, and practices, including the use of equipment and handling of hazardous materials.
- 7.0 – Responsibility and Flexibility: Students know the behaviors associated with the demonstration of responsibility and flexibility in personal, workplace, and community settings.
- 8.0 – Ethics and Legal responsibilities: Students understand professional, ethical, and legal behavior consistent with applicable laws, regulations, and organizational norms.

- 9.0 – Leadership and Teamwork: Students understand effective leadership styles, key concepts of group dynamics, team and individual decision making, the benefits of workforce diversity, and conflict resolution.
- 10.0 – Technical Knowledge and Skills: Students understand the essential knowledge and skills common to all pathways in the Agriculture and Natural Resources sector.
- 11.0 – Demonstration and Application: Students demonstrate and apply the concepts contained in the foundation and pathway standards.

DETAILED UNITS OF INSTRUCTION:

Unit 1: Domestic Animals, Production and Economic Impact. In this unit students will explore the process of animal domestication and the economic impact of animal agriculture in regards to the social economic balance, the plant and animal balance, and the effects on human health and nutrition. Students will study the production demographics of different regions, as well as the methodologies for producing livestock. Student will know the role hormones play in production.

Unit 2: Animal Behavior and Biology. In this unit students will delve into the nomenclature surrounding animal agriculture. Students will apply biology concepts by discussing the roles of animal cells, amino acids, protein synthesis, and natural selection to the life cycles of animals. They will explore the different behaviors exhibited during specific life phases including gestation, parturition, and post-parturition.

Unit 3: Musculoskeletal System. In this unit students will explore the parts of the musculoskeletal system, as well as how the parts work together. Students will then apply this knowledge to selecting and evaluating livestock. Special attention will be paid to skeletal conformity, muscle volume, fat deposition, productivity, and performance, as well as what parts of the musculoskeletal system impact these evaluation criteria.

Unit 4: Reproductive Systems. In this unit students will explore the processes of animal reproduction including estrous and estrus, gestation cycles, hormone role and parturition, as well as an exploration of the anatomy of the system. Students will also explore alternative means of reproduction from a scientific standpoint including artificial insemination and embryo transplantation.

Unit 5: Animal Breeding and Genetics. In this unit students will explore the processes of mitosis and meiosis and the principles of inheritance. Inheritance theory will be applied to livestock breeding decisions through the in-depth evaluation of dominant and recessive genes, analyzing complex inheritance patterns, and investigating mutations.

Unit 6: Digestive System. Students will compare and contrast monogastric and ruminant digestive systems in regards to anatomy, efficiency, and digestive processes. Students will explore the shortcomings and feeding requirements of each of these systems.

Unit 7: Animal Nutrition and Feeds. In this unit students will classify nutrients and explore the nutrient requirements of different species of livestock. They will analyze the need and use of macro and micro nutrients including minerals and vitamins. They will also balance feed rations and devise feeding plans to optimize animal growth.

Unit 8: Nervous System. In this unit students will explore the anatomy and physiology of the nervous system. They will investigate common neurological disorders that are an issue in animal agriculture including bovine spongiform encephalopathy (mad cow disease), scrapies, and the economic

impact of such disorders.

Unit 9: Cardiovascular and Respiratory Systems. In this unit students will explore the anatomy and physiology, as well as the function of both the respiratory system and the cardiovascular system. Special attention will be given to the mechanics of breathing and respiratory rates of animals and the pulse rates of animals. Students will conduct an in-depth analysis of how these systems function together to maintain homeostasis in the body. Students will perform a dissection of sheep hearts. This dissection will allow them to explore the anatomy of the heart and see how the valves work.

Unit 10: Common Integument and its Derivation. In this unit students will explore the role of the integumentary system. Special attention will be given to the skin, its structure, and its function. In addition, students will compare and contrast the physiology of lactation and mammary glands in different species.

Unit 11: Animal Health. In this unit students will explore the principles of animal health including prevention, treatment and eradication of disease. Students will investigate the principles of the American Veterinary Medical Association and explore common diseases. Students will also research the role of preventative measures including sanitation, vaccination, and other animal husbandry techniques. Special attention will be given to microbes and how they are spread including viruses, bacteria, parasites and prions.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbook

Modern Livestock and Poultry Production, by James R. Gillespie and Frank B. Flanders, Cengage Learning, 9th Edition, 2016.

Agriscience Fundamentals and Applications by L. DeVere Burton, Cengage Learning, 6th Edition. 2015.

Resource Materials

CEV Multimedia Pathway Unit - Advanced Animal Science (MPU10036) ISBN 9781603339162.

CEV Multimedia, 1020 SE Loop 289, Lubbock, TX 79464

Veterinary Medicines for Livestock: www.gov.uk/managing-livestock-veterinary-medicines

How to Write a Scientific Paper by Robert A. Day

Statistics for Veterinary and Animal Science by Aviva Petrie and Paul Watson

National FFA Research Report Template

<https://www.ffa.org/programs/awards/agrisciencefair/Pages/default.aspx>

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:

CCSS Reading Component:

HS-ETS1.1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1.2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

- HS-ETS1.3 Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
- RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CCSS Writing Component:

- WHST.9-12.1 Write arguments focused on *discipline-specific content*.
- WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- WHST.9-12.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
- WHST.9-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
- WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

CCSS Speaking and Listening Component:

- SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

CCSS Mathematics Component:

- MP.2 Reason abstractly and quantitatively.
- MP.4 Model with mathematics.

- HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- HSN-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.
- HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- HSF-BF.A.1 Write a function that describes a relationship between two quantities.
- HSS-ID.A.1 Represent data with plots on the real number line.
- HSS-IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
- HSS-IC.B.6 Evaluate reports based on data.

Next Generation Science Standards (NGSS):

Life Science:

- HS-LS1-1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
- HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- HS-LS1-3: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
- HS-LS1-4: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
- HS-LS1-6: Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
- HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
- HS-LS2-8: Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.
- HS-LS3-1: Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
- HS-LS3-2: Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.
- HS-LS3-3: Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
- HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
- HS-LS4-3: Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

Earth and Space Science:

- HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

Engineering, Technology, and Applications of Science:

HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

CTE STANDARDS TO BE ADDRESSED:

Agriscience Pathway Standards:

- C1.1-6: Students understand the role of agriculture in the California economy.
- C2.1-5: Students understand the interrelationship between agriculture and the environment.
- C3.1-4: Students understand the effects of technology on agriculture.
- C4.1-5: Students understand the importance of animals, the domestication of animals, and the role of animals in modern society.
- C5.1-4: Students understand the cell structure and function of plants and animals.
- C6.1-2: Students understand animal anatomy and systems.
- C7.1-5: Students understand basic animal genetics.
- C8.1-3: Students understand fundamental animal nutrition and feeding.
- C9.1-5: Students understand basic animal health.
- C12.1-3: Students understand fundamental pest management.
- C13.1-3: Students understand the scientific method.

Animal Science Pathway Standards:

- D1.0 Students understand the necessary elements for proper animal housing and animal handling equipment.
- D2.0 Students understand key principles of animal nutrition.
- D3.0 Students understand animal physiology.
- D4.0 Students understand animal reproduction, including the function of reproductive organs.
- D5.0 Students understand animal inheritance and selection principles, including the structure and role of DNA.
- D6.0 Students understand the causes and effects of diseases and illnesses in animals.
- D7.0 Students understand common rangeland management practices and their impact on a balanced ecosystem.
- D8.0 Students understand the challenges associated with animal waste management.
- D9.0 Students understand animal welfare concerns and management practices that support animal welfare.
- D10.0 Students understand the production of large animals (e.g., cattle, horses, swine, sheep, and goats) and small animals (e.g., poultry, cavy, rabbits).
- D11.0 Students understand the production of specialty animals (e.g., fish, marine animals, llamas, tall flightless birds).
- D12.0 Students understand how animal products and by-products are processed and marketed.

DISTRICT ESLRS TO BE ADDRESSED:

Students will be:

- **Self-Directed Learners:** Students will be required to work independently, monitor their progress and meet assignment requirements at stated intervals. This class will prepare students to be self-directed lifelong learners.
- **Constructive Thinkers:** Reading and analysis of text provided case studies and opposing points of view will develop students' problem solving/critical thinking skills.

- **Effective Communicators**: Students will communicate their understanding of agriculture concepts through written, visual and oral expression.
- **Collaborative Workers**: Students will need to identify and gather resources and information from outside the school and home to complete assignments in class. Students will need to work together to produce laboratory reports and scientific research.
- **Quality Producer/Performers**: Students will demonstrate successful performance through instructor assessments, completed FFA Record Book, public speaking, and SAE projects.
- **Responsible Citizens**: Students will become more knowledgeable of agriculture systems issues along with solutions needed and workplace expectations on a regional and global scale.

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