

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Agriscience 3: Advanced Plant and Animal Systems

CAC Approval Date: December 3, 2025 Board Approval Date: January 15, 2026	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 11, 12	Subject Area: Other Science, CTE Elective Area (if applicable):
Prerequisite(s): Agriscience 2	Corequisite(s):
CTE Sector/Pathway: Agriculture	
Intent to Pursue 'A-G' College Prep Status: Yes	
A-G Course Identifier: (d) Laboratory Science	
Graduation Requirement: Yes	
Course Intent: Site Specific Program (if applicable): CTE	
Folsom Cordova Unified School District 2024-2025 Nondiscrimination Statement The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, gender, gender identity, gender expression, immigration status, nationality, race or ethnicity, religion, sex, sexual orientation, or association with a person or a group with one or more of these actual or perceived characteristics. For questions or complaints, contact: Jim Huber, Ed.D., Assistant Superintendent, Educational Services Compliance Officer, Section 504 Coordinator, ADA Coordinator (students) jhuber@fcusd.org 916-294-9000 x 104580 Shannon Diaz, Director of Compliance Compliance Officer and Title IX Coordinator sdiaz@fcusd.org 916-294-9000 x 104415	

**1965 Birkmont Drive
Rancho Cordova, CA 95742**

The Folsom Cordova Unified School District does not discriminate on the basis of sex and prohibits sex discrimination in any education program or activity that it operates, as required by Title IX and its regulations, including in admission and employment.

Inquiries about Title IX may be referred to the Folsom Cordova Unified School District's Title IX Coordinator, the U.S. Department of Education's Office for Civil Rights, or both. The District Title IX Coordinator is:

**Shannon Diaz, Director of Compliance
Compliance Officer and Title IX Coordinator
sdiaz@fcusd.org
916-294-9000 x 104415
1965 Birkmont Drive
Rancho Cordova, CA 95742**

The District nondiscrimination policy can be located at:

<https://www.fcusd.org/district/about-us/nondiscrimination-statementpolicy>

The District's nondiscrimination complaint procedures can be located at:

Students: <https://www.fcusd.org/departments/compliance/complaints/uniform-complaints>

Staff: <https://www.fcusd.org/departments/compliance/complaints/nondiscrimination-in-employment>

To report information about conduct that may constitute sex discrimination or sex-based harassment, or make a complaint of sex discrimination or sex-based harassment under Title IX, please refer to:

Students: <https://www.fcusd.org/district/about-us/title-ix-notificationsexual-harassment>

Staff: <https://www.fcusd.org/departments/compliance/complaints/sexual-harrassment-title-ix>

COURSE DESCRIPTION:

Advanced Animal and Plant Science is an in-depth course designed to equip students with the advanced knowledge and practical skills needed to understand and address the complex challenges facing modern agriculture. Focusing on both plant and animal sciences, students will explore the intricate systems that sustain agricultural production, including animal anatomy and physiology, soil health, and the role of biotechnology in agriculture. Through a combination of theoretical lessons and practical applications, students will analyze how genetic, environmental, and biochemical factors influence the growth and health of plants and animals. The course will also address the role of veterinary science in maintaining animal health, exploring topics in pathology, microbiology, and advanced breeding techniques. Students will be challenged to think critically and ethically about the future of agriculture, with an emphasis on sustainability, innovation, and ethical considerations in biotechnology. By the end of the course, students will be prepared for higher education in agricultural sciences, veterinary medicine, or related fields, with a deep understanding of the interdisciplinary nature of agricultural science.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Advanced Animal Anatomy and Physiology	*How do the systems in the body of animals work together to maintain homeostasis? *What are the structural and functional differences between various animal species' body systems?	*Quiz on animal body systems: Students will complete a multiple-choice quiz on the major systems in animals (digestive, circulatory, respiratory, etc.). *Group Diagram Activity: Students will work in groups to label and explain the functions of organs in the animal body (e.g., heart, lungs, kidneys).	*Animal Body System Project: Students will research and create a model (physical or digital) that shows how two or more animal body systems interact. They will present this to the class, explaining their chosen animal's physiology and how the systems work together. *Written Report: After a dissection (if possible) or virtual lab, students will submit a detailed report on the anatomy and functions of the organs observed during the activity.
C6.0: Explore animal anatomy and systems. C6.2: Explain the anatomy and major functions of vertebrate systems, including digestive, nervous, circulatory, and respiratory systems. C3.5: Integrate the use of technology when collecting and analyzing data. HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. WHST.11-12.2: Write informative/explanatory texts to examine and convey complex ideas clearly and accurately.			
2. Pathology and Microbiology in Veterinary Science	*What are the common causes and symptoms of diseases in animals? *How do pathogens such as bacteria, viruses, and fungi affect animal health? *How can animals' immune systems defend against infections?	*Case Study Discussions: Present a real-world scenario involving an animal disease outbreak (e.g., avian flu, foot-and-mouth disease). Students will identify the pathogen, its symptoms, and treatment options. *Bacteria vs. Virus Chart: Create a comparison chart for the characteristics of bacteria and viruses, listing the differences in their structure,	*Research Presentation: Students will research a specific animal disease, its symptoms, prevention, and treatment, and present their findings to the class using visuals and data. *Pathogen Identification Lab: After conducting lab tests (e.g., petri dish cultures), students will identify pathogens and

		modes of transmission, and types of diseases they cause.	present their findings with a report on the methods used and conclusions drawn.
C5.0: Compare the structure and function of plants, animals, bacteria, and viruses. C5.2: Analyze the anatomy and physiology of cells. C9.0: Evaluate basic animal health. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs. WHST.11-12.7: Conduct short and sustained research projects to answer a question or solve a problem.			
3. Advanced Plant Growth and Development	*How do environmental factors influence plant growth and development? *What are the molecular and cellular processes that drive plant growth?	*Interactive Plant Growth Simulation: Students will use a virtual lab or simulation to adjust variables (e.g., water, light, temperature) and observe how they affect plant growth. *Plant Growth Journal: Over several weeks, students will monitor the growth of a plant, recording data on key factors that impact its development.	*Plant Growth Experiment: Students will design and carry out a controlled experiment, varying one aspect of the environment (light, temperature, etc.) to determine how it affects plant growth. Students will present their experiment results and conclusions. *Plant Dissection: Students will dissect a plant to observe its anatomy (roots, stems, leaves), explaining the function of each part in plant growth and development.
C11.0: Analyze plant growth and development. C11.4: Examine sexual and asexual reproduction in plants. HS-LS2-3: Construct and revise an explanation for how resource availability affects organism populations and ecosystems.			
4. Advanced Genetics in Agriculture	*How do genetic traits affect the development of plants and animals in agriculture? *How can genetic engineering and breeding techniques improve agricultural productivity?	*Genetics Problem Set: Students will complete problem sets to practice Mendelian genetics, including Punnett squares and predicting genetic outcomes. *Genetic Trait Research: Students will research the genetic traits of a specific breed of livestock or plant species, explaining how these traits influence agricultural practices.	*Genetic Modification Case Study: Students will research a case where genetic engineering was used to enhance agricultural products (e.g., Bt corn, disease-resistant animals) and evaluate the benefits and risks. *Genetic Breeding Plan: Students will design a breeding plan for a

			specific agricultural species, using genetic principles to select desirable traits.
C7.0: Comprehend basic animal genetics. C7.3: Predict phenotype and genotype ratios by using a Punnett Square. C7.4: Explain the fertilization process. C7.5: Distinguish between the purpose and processes of mitosis and meiosis. C11.4: Examine sexual and asexual reproduction in plants. HS-LS1-1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins. HS-LS3-2: Make and defend a claim based on evidence that inheritable genetic variations may result from new genetic combinations.			
5. Animal Breeding and Reproduction	*How do breeding and reproduction strategies vary between animal species in agriculture? *What factors must be considered when planning breeding for specific traits in agricultural animals? *How do we identify and maintain animal records?	*Reproductive System Comparison: Students will compare the reproductive systems of different species (e.g., mammals, poultry, livestock), highlighting key differences and similarities. *Breeding Strategy Case Study: Students will analyze a case where a particular breeding strategy was used successfully (e.g., artificial insemination in dairy cows) and suggest improvements based on their understanding.	*Breeding Program Proposal: Students will develop a breeding program for a specific agricultural animal (e.g., cattle, pigs), justifying their selection of traits and the breeding methods used. *Reproductive Health Report: Students will research common reproductive issues in farm animals (e.g., infertility, dystocia) and propose management strategies.
C6.0: Explore animal anatomy and systems. C6.2: Explain the anatomy and major functions of vertebrate systems, including reproductive systems. C9.3: Analyze the causes and controls of common animal diseases. C9.5: Research the legal requirements for the procurement, storage, methods of application, and withdrawal times of animal medications. C3.2: Understand how technology influences labor, efficiency, and sustainability. C3.5: Integrate the use of technology when collecting and analyzing data.			
6. Advanced Soil Science and Fertility	*How do the physical, chemical, and biological properties of soil influence its fertility and ability to support life? *How can soil management practices maintain or improve soil fertility while preventing degradation and	*Soil Testing Lab: Students will conduct soil tests to analyze pH, nutrient levels, and other characteristics, and recommend amendments based on the test results. *Soil Fertility Concept Map: Create a concept map linking soil health, fertility,	*Soil Fertility Plan: Based on soil test results from a local area, students will design a soil fertility management plan, selecting appropriate fertilizers and amendments to improve soil health and

	promoting long-term sustainability?	microorganisms, and plant growth.	productivity. *Soil Erosion Report: After researching soil erosion impacts, students will write a report on strategies for preventing soil degradation in agricultural systems.
C10.0: Evaluate soil and water systems used in agriculture. C10.1: Identify physical, chemical, and biological properties of soil. C11.0 (overall): Analyze how environmental and soil factors affect plant development. C10.3: Demonstrate soil management practices that conserve soil and water. HS-LS2-6: Evaluate the claims, evidence, and reasoning that complex interactions in ecosystems maintain stability.			
7. Veterinary Medicine and Animal Health Management	*How do veterinary professionals diagnose and treat common animal diseases in agricultural settings? *What are the responsibilities of animal caretakers in maintaining animal health?	*Animal Health Case Study: Students will analyze a case where an animal has been diagnosed with a specific disease, and propose a treatment plan. *Health Monitoring Log: Students will track the health indicators (e.g., temperature, behavior, physical condition) of livestock over time, identifying signs of common illnesses.	*Veterinary Science Report: Students will research a veterinary technique or treatment (e.g., vaccinations, parasite control) and prepare a report on its application in farm animal health. *Diagnostic Lab: Students will participate in a mock diagnostic procedure (possibly using models or simulations) where they must identify common animal diseases and suggest treatments.
C9.0: Evaluate basic animal health. C9.3: Analyze the causes and controls of common animal diseases. C9.4: Identify the signs and symptoms of disease and abnormal conditions in animals. HS-LS2-6: Evaluate the claims, evidence, and reasoning that complex interactions in ecosystems maintain stability. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs.			
8. Ethics and Biotechnology in Agriculture	*What are the ethical considerations surrounding biotechnology in agriculture? *How does biotechnology influence the future of food production and animal husbandry?	*Biotechnology Debate: Students will participate in a class debate on a controversial issue in agricultural biotechnology (e.g., GMOs, cloning). *Ethical Dilemma Discussion: Students will analyze a	*Biotechnology Position Paper: Students will write a research-based position paper on a current biotechnology topic in agriculture, including ethical considerations and potential impacts on

		scenario involving the use of biotechnology in agriculture (e.g., genetically modified crops) and argue for or against its use.	animal and plant industries. *Biotech Application Presentation: Students will research and present a real-world application of biotechnology (e.g., gene editing in plants, animal cloning), discussing its scientific basis, potential benefits, and ethical concerns.
C3.0: Analyze the effects of technology on agriculture. HS-LS3-3: Apply concepts of statistics and probability to explain variation and distribution of expressed traits in a population. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs. HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria for solutions that account for societal needs and constraints.			

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

[http://www.corestandards.org/ELA-Literacy/RST/11-](http://www.corestandards.org/ELA-Literacy/RST/11-12/)

[12/https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandaug2013.pdf](https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandaug2013.pdf)

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/ci/sc/cf/documents/scifwchapter7.pdf>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

<https://www.cde.ca.gov/ci/ct/sf/documents/agnatural.pdf>

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Textbook Title ISBN #	Author(s)	Publisher	Edition
<i>Yes</i>	<i>Principles of Agriculture, Food and Natural Resources 2nd Edition Digital</i>	John S. Rayfield, Kasee L. Smith, Travis D. Park, and D. Barry Croom	G-W	2nd