Animal Systems
Supplemental Program Resources

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Supplemental Program Resources 2021

Introduction

This document provides supplemental information for the Animal Systems program of study. It may be updated or revised as the base program of study, or complementary programs, are updated, added, or removed. Please contact the appropriate Education Programs Professional with any questions.

The Program of Study includes the approved courses, complementary courses, alignment(s) to industry, postsecondary options, and additional information.

The Equipment List for the Animal Systems program of study is included and, if applicable, additional items used only in the complementary course(s) are noted.

The Crosswalks and Alignments connect and support the Animal Systems standards for the Agriculture, Food, and Natural Resources program of study. Complementary course standards are not listed in the crosswalks and alignments.

Program of Study Information

The following program of study information sheet as well as the program structure tables for the courses are provided to be able to print separately for handouts. The information provided is based on the best available information at the time of this document and will be updated as appropriate.

Animal Systems

The Animal Systems program provides students with the principles of the livestock and red meat industry. Areas of study include the basic anatomy and physiology of domestic animals, genetics, reproduction, animal health and welfare, evaluation and selection of animals, land stewardship, marketing, careers, and leadership development.

Agricultural, Food, and Natural Resource Career Cluster

This Career Cluster® is focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources.

Postsecondary Options

Secondary

- Certificate of Skills Attainment

Skills Certificate

- Veterinary Assistant (TMCC)

Associate's Degree

- Applied Science (TMCC)
- Veterinary Nursing (TMCC) (CSN)
- Veterinary Technician Certification (CSN)

Bachelor's Degree

- Biological Science (UNLV, UNR, TMCC, CSN, WNC)
- Agricultural Sciences (UNR)
- Veterinary Science (UNR)
- Rangeland Ecology and Management (UNR)

Master's/Doctoral Degree

- Biological Science (UNLV, UNR)
- Animal Science (UNR)
- Rangeland Ecology and Management (UNR)

For additional information on this cluster, please contact:
Kristina Carey at kcarey@doe.nv.gov

Website: https://doe.nv.gov/CTE/

Approved Courses

Principals of Agriculture, Food, and Natural Resources
Animal Science

Complementary Courses

Animal Science Advanced Studies
Agriculture Business Systems
Agriculture Leadership, Communication, and Policy
Environmental and Natural Resources Management
Food Science Technology
Veterinary Science
CTE Work Experience – Agriculture Science
Industry Recognized Credential – Animal Science

Work-Based Learning Opportunities

Job Shadowing / Internship / Work Experience / Career Days / Career Fairs / Field Trips / Guest Speakers

Career and Technical Student Organization

FFA – The National FFA Organization

State Recognized Industry Certifications

Refer to the Governor's Office of Innovation's
Nevada Eligible Industry Credentialing List

Aligned to Industry

Occupation	Median Wage Per year	Annual Openings	% Growth
Natural Sciences Managers	$137,900	6,900	6.0%
Farmers, Ranchers, and Other Agricultural Managers	$73,060	85,600	-3.0%
Agricultural and Food Science Technicians	$44,700	4,900	9.0%
Sales Engineers	$103,710	6,900	6.0%
Veterinarians	$100,370	4,800	19.0%

Source U.S. Bureau of Labor Statistics 2022

Program Structure for Animal Systems

The core course sequencing is provided in the following table. Complementary Courses are available and provided later in this document. The following courses provide a completed program of study.

Core Course Sequence (R) with Lab Course(s) (C)

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
R	Principles of Agriculture, Food and Natural Resources	AG SCIENCE	01.0000	18	003	G	1.00	12	18003G1.0012
R	Animal Science	ANIMAL SCI	01.0901	18	101	G	1.00	22	18101G1.0022

The complementary courses are provided in the following table. **The qualifying program of study must be completed prior to enrolling in the complementary course(s)**. A program does not have to utilize the complementary courses for students to complete their program of study.

Required/ Complementary	Course Title	Abbreviated Name	CIP Code	SCED Subject Area	SCED Course Identifier	SCED Course Level	SCED Unit Credit	SCED Course Sequence	SCED Course Number
C	Animal Science Advanced Studies	ANIMAL SCI AS	01.0901	18	101	E	1.00	11	18101E1.0011
C	Agriculture Business Systems	AG BUS AN	01.0102	18	201	E	1.00	11	18201E1.0011
C	Agriculture Leadership, Communication, and Policy	AG LCP AN	01.0899	18	203	E	1.00	11	18203E1.0011
C	Environmental and Natural Resources Management	ENR MGMT AN	03.0101	18	504	E	1.00	11	18504E1.0011
C	Food Science Technology	FOOD SCI TECH AN	01.1001	18	305	E	1.00	11	18305E1.0011
C	Veterinary Science	VETERINARY SCI	01.8301	18	105	E	1.0	11	18105E1.0011
C	CTE Work Experience-Agriculture, Food, and Natural Resources	WORK EXPER	99.0001	18	998	G	1.00	11	18998G1.0011
C	Industry-Recognized Credential – Animal Systems	IRC ANIMAL SYS	01.0901	18	999	E	1.00	11	18999E1.0011

CIP Code – Classification of Instructional Programs (CIP) Codes

SCED – School Courses for the Exchange of Data that populates the State Infinite Campus System and the System for Accountability Information in Nevada (SAIN)

Course Descriptions

Principles of Agriculture, Food, and Natural Resources

Prerequisite: None

This course is an introduction and survey course of the many career areas in agriculture. Topics include scientific investigations in agriculture, basic animal science, basic plant and soil science, ornamental horticulture, natural resource management, business management, leadership, and communication through FFA, and career skills. An essential part of this course will be leadership activities and Supervised Agricultural Experience Programs.

Animal Science

Prerequisite: Principles of Agriculture, Food, and Natural Resources

This course is a continuation of Principles of Agriculture, Food, and Natural Resources. This course allows advanced students to expand on skills and knowledge from Principles of Agriculture, Food, and Natural Resources while exploring the livestock and companion animal industries. This course covers the basic anatomy and physiology of domestic animals, genetics, reproduction, animal health and welfare, evaluation and selection of animals, land stewardship, and marketing. An essential part of this course will be leadership activities and Supervised Agricultural Experience Programs. The appropriate use of technology and industry-standard equipment is an integral part of this course. Upon successful completion of this course, students will have acquired entry-level skills for employment and be prepared for postsecondary education.

Animal Science Advanced Studies

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in a program and desire to pursue advanced study through investigation and in-depth research. Students are expected to work independently or in a team and consult with their supervising teacher for guidance. The supervising teacher will give directions, monitor, and evaluate the students' topic of study. Coursework may include various work-based learning experiences such as internships and job shadowing, involvement in a school-based enterprise, completion of a capstone project, and/or portfolio development. This course may be repeated for additional instruction and credit.

Agricultural Business Systems for Animal Systems

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in the Animal Systems program of study. This course provides advanced agriculture students with the information and skills necessary for success in agribusiness and in operating entrepreneurial ventures in the agricultural industry. These courses may cover topics such as economic principles, budgeting, risk management, finance, business law, marketing and promotion strategies, insurance, and resource management. Other possible topics include developing a business plan, employee/employer relations, problem-solving and decision making, commodities, and building leadership skills. These courses may also incorporate a survey of the careers within the agricultural industry. An essential part of this course will be leadership activities and Supervised Agriculture Experience Programs.

Agricultural Leadership, Communication, and Policy (Animal)

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in the Animal Systems program of study. This program provides advanced agriculture students with instruction on leadership and communication skills with a focus on opportunities in the agriculture industries. Topics will include communication research, verbal and written communications, journalism, mass media, agriculture policy and human relations. Other topics may include problem solving and decision making and teamwork skills. An essential part of this course will be leadership activities and Supervised Agriculture Experience Programs.

Environmental and Natural Resources for Animal Systems

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in the Animal Systems program of study. This course introduces advanced agriculture students to concepts of environmental natural resource science and management. This will include ecological concepts and scientific principles related to environmental science, soils, composting and recycling, rangeland management, fire ecology, GPS and GIS, fish and wildlife ecology, forestry, renewable and nonrenewable resources, and fish and wildlife management. An essential part of this course will be leadership activities and Supervised Agriculture Experience Program.

Food Science Technology for Animal Systems

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in the Animal Systems program of study. This course allows advanced students to expand on skills and knowledge from Animal Systems program of study while exploring the livestock and meat industry. This course covers the basic anatomy and physiology of domestic animals, genetics, reproduction, animal health and welfare, evaluation and selection of animals, land stewardship and marketing. An essential part of this course will be leadership activities and Supervised Agriculture Experience Programs. The appropriate use of technology and industry-standard equipment is an integral part of this course.

Veterinary Science

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in the Animal Systems program of study. This course is designed to introduce advanced agriculture students to the technical understanding and working knowledge of the veterinary industry. Topics to be covered include practices in the veterinary clinical setting, medical terminology, medical math, clinical examination, laboratory techniques, diseases and disorders, nutrition, clinical and office procedures, and ethical and welfare issues. An essential part of this course will be leadership activities and Supervised Agriculture Experience Programs. The appropriate use of technology and industry-standard equipment is an integral part of this course.

CTE Work Experience – Agriculture, Food, and Natural Resources

Prerequisite: Completion of Level 2 course in the qualifying program of study

This course is designed to expand the students' opportunities for applied learning. This course provides an in-depth CTE work experience that applies the processes, concepts, and principles as described in the classroom instruction. This course will encourage students to explore and develop advanced skills through work-based learning directly related to the program of study. The course must follow NAC 389.562, 389.564, 389.566 regulations.

Industry-Recognized Credential – Animal Systems

Prerequisite: Completion of Animal Systems Program of Study

This course is offered to students who have completed all content standards in a program of study and desire to pursue an Industry-Recognized Credential that aligns with the standards and skills associated with the Animal Systems Program of Study. This course is designed to expand the students' opportunities to pursue certification aligned with employment standards in the industry aligned with this program of study. The supervising teacher will provide instruction aligned with the certification requirements, monitor progress toward certification, and provide the students with appropriate testing or certification opportunities associated with the intended Industry-Recognized Credential that is the subject of the course. This course may be repeated for additional instruction and credit.

Supplemental Program Resources 2021

Equipment List

This recommended list is based upon a classroom size of 25 students. All costs are estimated and may be adjusted once verified and justified by districts with current quotes. No specific equipment vendor or brand names are endorsed due to various possibilities, but school districts should consult with stakeholders to ensure industry-recognized equipment and software are purchased. The intent of this list is to provide school districts with guidance on the equipment needed to implement the state standards for an Animal Systems program.

CTE Classroom Equipment **Total: $42,550**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Workstations w/chairs	$400	$10,000
25	Student Computers	$1,000	$25,000
1	Teacher Workstation w/chair	$400	$400
1	Teacher Computer	$900	$900
Varies	Computer Accessories (cases, covers, etc.)	$500	$500
1	Presentation Equipment (e.g., interactive display system with software)	$3,000	$3,000
1	Networkable Laser Printer (black/white or color)	$400	$400
1	Technology Storage/Charging System (lockable)	$500	$500
2	Storage Cabinets (36” x 12” x 72”) (lockable)	$300	$600
1	Eyewash Station	$300	$300
1	3 Compartment Sink w/ soap dispenser	$700	$700
1	Fire Extinguisher	$150	$150
1	First Aid Kit	$100	$100

Program Equipment **Total: $33,600**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
1	Commercial Cooler/Refrigerator	$10,000	$10,000
6	Stainless tables	$500	$3,000
Varies	Meat Product Educational Resources	$300	$300
Varies	Stainless Steel Storage Racks	$1,000	$1,000
1	Animal Sonography Equipment	$3,000	$3,000
1	Bovine Injection Simulator	$5,000	$5,000
1	Autoclave	$1,000	$1,000
1	Surgical Bath	$1,500	$1,500
Varies	Personal Protective Equipment (PPE) (gowns, gloves, face shields, etc.)	$800	$800
Varies	Animal System Models	$3,500	$3,500
Varies	Animal Restraint Equipment (halters, snares, etc.)	$2,000	$2,000
1	Lab Centrifuge	$400	$400
1	Cell Division Model	$100	$100
Varies	Identification Resources (Classification guides, breed identification, etc.)	$2,000	$2,000

Supplemental Program Resources 2021

Instructional Materials Total: $11,500

QTY	ITEM DESCRIPTION	UNIT	TOTAL
25	Student Textbooks (Approved by NDE)	$100	$2,500
25	Student Access to Online Textbook	$100	$2,500
1	Teacher Textbook Edition and Resources	$500	$500
1	Curriculum Software Package	$400	$400
1	Office Productivity Software	$400	$400
4	Curriculum Platform Access	$800	$3,200
1	FFA Curriculum Package	$2,000	$2,000

Instructional Supplies Total: $17,300

QTY	ITEM DESCRIPTION	UNIT	TOTAL
12	Classroom Microscopes	$400	$4,800
12	Surgical Instrument Sets	$200	$2,400
12	Soil Testing Kit	$100	$1,200
12	Water Testing Kit	$100	$1,200
Varies	Lab Testing Supplies (re-agents, indicators, probes, etc.)	$1,500	$1,500
Varies	Botany Resources for Identification	$1,000	$1,000
Varies	Various Lab Items (beakers, tubes, plates, etc.)	$1,000	$1,000
Varies	Personal Protective Equipment (PPE) (gowns, gloves, face shields, etc.)	$800	$800
Varies	Animal Industry and Breed Resources	$500	$500
Varies	Floral Supplies (flowers, mechanical tools, design products, etc.)	$500	$500
Varies	Grading Resources for Meats, Vegetables, and Grains	$500	$500
Varies	Plant Propagation Supplies (soil, pots, tools, seeds, etc.)	$500	$500
Varies	Feed and Supplement Samples	$200	$200
Varies	Medication Equipment (syringes, needles, drenches, balling guns, etc.)	$200	$200
Varies	Feed Testing Equipment (small scales, burners, samples, etc.)	$200	$200
Varies	Animal Charts and Posters	$200	$200
Varies	Culture and Pathogen Slide Collections	$400	$400
Varies	Parasite Collections	$200	$200

Other Total: $450

QTY	ITEM DESCRIPTION	UNIT	TOTAL
1	Occupational Safety and Health Administration (OSHA) Instructor Training	$300	$300
1	ServSafe Instructor Certification	$150	$150

Category Totals:	
Classroom Equipment	$42,550
Program Equipment	$33,600
Instructional Materials	$11,500
Instructional Supplies	$17,300
Other	$450
Estimated Program Total	**$105,400**

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Complementary Course(s) Equipment List Addendum

Program Equipment **Total: $43,300**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
1	Commercial Smoker	$5,000	$5,000
1	Industrial Mixer	$500	$500
1	Meat Grinder	$500	$500
Varies	Food Processing Equipment and Tools (slicer, blender, cleavers, etc.)	$2,000	$2,000
1	Freezer	$5,000	$5,000
Varies	Food Preservation Equipment (dehydrator, preservative, etc.)	$2,000	$2,000
Varies	Packaging Equipment and Supplies (paper, labels, shrink wrap, etc.)	$2,000	$2,000
Varies	Sanitation Equipment and Supplies (mats, hose, nozzles, brushes, etc.)	$3,000	$3,000
3	Exam Tables w/ cabinets or lift	$2,200	$6,600
Varies	Artificial Insemination Simulators (Bovine, Porcine, Equine, etc.)	$7,500	$7,500
3	Small Animal Mannequins (small canine, large canine, feline)	$1,200	$3,600
4	Small Animal Kennels	$200	$800
6	Unmanned Aerial Vehicles/Drones	$400	$2,400
12	Global Positioning System/Geographic Information System (GPS/GIS) units	$200	$2,400

Instructional Supplies **Total: $2,700**

QTY	ITEM DESCRIPTION	UNIT	TOTAL
Varies	Hunter Education Resources	$800	$800
Varies	Reproductive Equipment (tanks, straws, thermos, etc.)	$400	$400
Varies	Suture Equipment and supplies	$500	$500
Varies	Wildlife Identification Collections (Skulls, hides, tracks, scat, etc.)	$1,000	$1,000

Category Totals:

Program Equipment	$43,300
Instructional Supplies	$2,700
Estimated Complementary Course Total	**$46,000**

Crosswalks and Alignments for Program of Study Standards

Crosswalks and alignments are intended to assist the teacher make connections for students between the technical skills within the program and academic standards. The crosswalks and alignments are not intended to teach the academic standards but to assist students in making meaningful connections between their CTE program of study and academic courses. The crosswalks are for the required program of study courses, not the complementary courses.

Crosswalks (Academic Standards)

The crosswalks of the Animal Systems Standards show connections with the Nevada Academic Content Standards. The crosswalk identifies the performance indicators in which the learning objectives in the Animal Systems program connect with and support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in English Language Arts, Mathematics, and Science.

Alignments (Mathematical Practices)

In addition to connections with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Animal Systems Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Animal Systems program connect with and support academic learning.

Alignments (Science and Engineering Practices)

In addition to connections with the Nevada Academic Content Standards for Science, many performance indicators support the Science and Engineering Practices. The following table illustrates the alignment of the Animal Systems Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the Animal Systems program connect with and support academic learning.

Crosswalks (Common Career Technical Core)

The crosswalks of the Animal Systems Standards show connections with the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Animal Systems program connect with and support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Animal Systems Standards are crosswalked to the Agriculture, Food, and Natural Resources Career Cluster™ and the Animal Systems Career Pathway.

Crosswalk of Animal Systems Program of Study Standards and the Nevada Academic Content Standards

English Language Arts: Language Standards

Nevada Academic Content Standards		Performance Indicators
L.11-12.1b	Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed.	24.1.1
L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	1.5.2

English Language Arts: Reading Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards		Performance Indicators
RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.	18.14, 18.3.2, 18.4.2, 18.5.2, 13.5.3, 18.6.2
RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.	7.3.2; 13.2.4; 19.1.1; 21.1.4
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.	4.1.3; 6.2.1; 10.1.2, 10.2.2; 11.3.1; 16.1.1; 17.2.2; 18.1.2; 20.1.1, 20.1.2; 21.1.1, 21.2.3
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.	2.1.1, 2.1.2; 4.1.2; 5.2.1, 4.1.2; 7.2.1, 7.3.5, 7.3.6, 7.4.2, 7.4.3; 8.1.2; 12.1.1, 12.4.3, 12.5.2, 12.6.1, 12.6.2, 12.6.3; 14.2.2, 14.4.2; 15.2.1; 17.1.1; 18.1.7, 18.2.7, 18.3.6, 18.4.6, 18.6.5
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.	2.2.1, 2.2.3, 2.3.1, 1.2.1; 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.4.1, 3.4.2; 4.2.2, 4.2.3; 5.1.1, 5.1.3; 6.1.1, 6.2.2, 6.3.1; 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, 7.1.6, 7.1.7, 7.1.8, 7.2.2, 7.2.3, 7.3.1, 7.4.1; 12.3.1, 12.4.1, 12.4.2; 13.1.1, 13.1.4, 13.1.5, 13.1.6; 14.1.2, 14.3.1, 14.4.1, 14.4.3; 15.1.1, 15.1.2, 15.1.3, 15.1.4, 15.5.2, 15.2.3, 15.2.4; 16.3.2; 17.2.1, 17.5.1, 17.5.2; 18.1.1, 18.2.2, 18.2.3, 18.3.1, 18.3.4, 18.4.1, 18.5.1, 18.5.5, 18.6.1; 21.1.3

English Language Arts: Speaking and Listening Standards

Nevada Academic Content Standards		Performance Indicators
SL.11-12.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.	14.2.3, 14.3.2; 16.2.2
SL.11-12.1a	Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.	1.1.1, 1.1.2, 1.2.1, 1.2.4, 1.4.2, 1.5.2; 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.3.1; 3.1.3, 3.4.1; 4.1.2; 5.2.1, 5.3.2; 6.1.1; 7.1.1, 7.1.5, 7.1.7, 7.2.1, 7.2.2, 7.3.1, 7.3.2, 7.3.5, 7.3.6, 7.4.2, 7.4.3; 8.1.2; 12.1.1, 12.3.1, 12.4.3, 12.5.2, 12.6.3; 13.1.11, 13.2.2; 14.1.2, 14.2.2, 14.2.3, 14.3.4, 14.4.2; 15.2.1, 15.2.3, 15.2.4; 16.3.1; 17.1.1, 17.5.1; 18.1.6, 18.1.7, 18.2.6, 18.2.7, 18.3.5, 18.3.6, 18.4.5, 18.4.6, 18.5.7, 18.6.4, 18.6.5; 21.1.3
SL.11-12.1b	Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.	23.1.1
SL.11-12.1c	Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.	13.2.3; 14.3.3; 16.3.3; 18.1.3, 18.1.3, 18.2.2, 18.4.3, 18.5.4, 18.6.3
SL.11-12.1d	Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.	13.2.4; 14.3.3; 16.3.3; 18.1.3, 18.2.4, 18.3.3, 18.4.3, 18.5.4, 18.6.3; 21.1.4
SL.11-12.2	Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.	1.1.1, 1.1.2, 1.2.1, 1.2.4, 1.4.2; 3.3.1; 6.2.2
SL.11-12.3	Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.	3.3.1
SL.11-12.4	Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.	1.1.1, 1.1.2, 1.2.1, 1.2.4, 1.4.2, 1.5.2; 2.1.3, 2.1.4, 2.1.5; 4.1.3; 6.2.1; 10.1.2, 10.2.2; 11.3.1; 14.3.4; 16.1.1, 16.3.1; 17.2.2; 18.1.6, 18.2.6, 18.3.5, 18.4.5, 18.5.7, 18.6.4; 19.1.3, 19.1.4, 19.1.5, 19.1.6; 20.1.1, 20.1.2; 21.1.1, 21.1.2; 21.1.1, 21.1.2

English Language Arts: Writing Standards for Literacy in Science and Technical Subjects

Nevada Academic Content Standards		Performance Indicators
WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.	17.4.1
WHST.11-12.2b	Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.	4.1.3; 6.2.1;
WHST.11-12.2d	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.	14.3.3; 19.1.1, 19.1.2
WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	1.2.5, 1.4.1; 2.3.1; 3.1.3, 3.4.1; 6.1.1; 7.1.1, 7.1.3, 7.1.5, 7.1.7, 7.2.2, 7.3.1; 12.3.1; 13.1.1; 14.1.2; 15.2.3, 15.2.4; 17.5.1; 21.1.3; 24.1.2
WHST.11-12.5	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.	1.4.4
WHST.11-12.6	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	1.4.5
WHST.11-12.7	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.	5.4.2; 6.6.2; 7.5.2; 8.2.2; 9.2.2; 10.3.2; 11.6.1, 11.6.2; 16.1.2; 22.1.1
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.	1.1.2, 1.1.3, 1.4.2, 1.4.3, 1.5.2; 2.1.1, 2.1.2, 2.2.1, 2.2.3, 2.3.2; 3.1.2, 3.1.4, 3.2.1, 3.4.2; 4.1.1, 4.1.2, 4.2.1, 4.2.2; 5.1.1, 5.1.3, 5.2.1, 5.3.2; 6.1.2, 6.1.3, 6.1.4, 6.2.2, 6.3.1, 6.4.1; 7.1.2, 7.1.4, 7.1.6, 7.1.8, 7.2.1, 7.2.3, 7.3.2, 7.3.5, 7.3.6, 7.4.1, 7.4.2, 7.4.3; 8.1.2; 9.1.1, 9.1.2, 9.1.3, 9.1.4; 10.3.2; 11.2.1, 11.2.2, 11.2.3, 11.4.2, 11.4.3, 11.4.4, 11.5.1, 11.5.2, 11.5.3; 12.1.1, 12.1.2, 12.1.3, 12.2.1, 12.2.2, 12.3.2, 12.4.1, 12.4.2, 12.4.3, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.6.1, 12.6.2, 12.6.3, 12.6.4; 13.1.2, 13.1.3, 13.1.4, 13.1.5, 13.1.6;

		14.2.2, 14.3.1, 14.3.3, 14.3.4, 14.4.1, 14.4.2, 14.4.3; 15.1.1, 15.1.2, 15.1.3, 15.1.4, 15.2.1, 15.2.2, 15.2.5; 16.2.1, 16.3.2; 17.1.1, 17.2.1, 17.5.2, 17.5.3; 18.1.1, 18.1.7, 18.2.2, 18.2.3, 18.2.7; , 18.3.1, 18.3.4, 18.3.6, 18.4.6, 18.5.1, 18.5.5, 18.5.5, 18.6.1, 18.6.5; 19.1.1, 19.1.2
WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.	14.1.1; 17.1.2, 17.4.1

Math: Algebra – Creating Equations

Nevada Academic Content Standards		Performance Indicators
ACED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	13.2.4

Science: HS. Earth and Space Sciences – HS. Earth's Systems

Nevada Academic Content Standards		Performance Indicators
HS-ESS2-2	Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.	8.1.4; 11.5.3
HS-ESS2-5	Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.	11.4.4
HS-ESS2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	11.4.4

Science: HS. Earth and Space Sciences – HS. Human Sustainability

Nevada Academic Content Standards		Performance Indicators
HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	2.1.1, 2.1.2, 2.1.4; 11.2.2; 20.1.1, 20.1.2
HS-ESS3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.	11.1.2, 11.1.3; 11.2.3
HS-ESS3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	11.2.1
HS-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	11.2.3, 11.3.1

Science: HS. Engineering Design

Nevada Academic Content Standards		Performance Indicators
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.	2.1.3, 2.3.1, 2.3.2
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.	2.1.5, 2.2.2, 2.2.3

Science: Science: HS. Life Sciences – HS. Structures and Function

Nevada Academic Content Standards		Performance Indicators
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.	6.1.1, 6.1.2, 6.1.3, 6.1.4; 12.5.3; 15.2.2
HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	6.4.1; 7.1.1, 7.1.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6; 12.1.1, 12.1.2, 12.2.1, 12.3.1, 12.3.2, 12.4.1, 12.4.2, 12.4.3, 12.5.1, 12.5.2, 12.5.4, 12.6.1, 12.6.2, 12.6.3, 12.6.4
HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	13.1.6; 14.3.1, 14.4.3; 17.4.3
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.	13.1.1, 13.1.4
HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.	7.2.3, 7.2.4; 13.1.2, 13.1.6, 13.3.2

Science: HS. Life Sciences – HS. Interdependent Relationships in Ecosystems

Nevada Academic Content Standards		Performance Indicators
HS-LS2-4	Mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	11.4.4
HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.	11.4.4
HS-LS2-6	Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.	11.4.3
HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	17.5.1
HS-LS2-8	Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	11.4.1; 18.1.1, 18.1.2, 18.1.3, 18.1.4, 18.2.2, 18.2.3, 18.2.4, 18.3.1, 18.3.2, 18.3.3, 18.4.1, 18.4.2, 18.4.3, 18.5.1, 18.5.2, 18.5.3, 18.5.4, 18.5.5, 18.6.1, 18.6.2, 18.6.3; 20.1.1, 20.1.2

Science: HS. Life Sciences – HS. Inheritance and Variation of Traits

Nevada Academic Content Standards		Performance Indicators
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.	14.2.1, 14.2.2, 14.3.2, 14.3.4; 15.1.2, 15.2.3, 15.2.4
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.	11.4.1, 14.1.1, 14.3.2, 14.3.4; 15.2.1
HS-LS3-3	Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.	14.1.1, 14.3.2, 14.3.4; 15.2.5

Science: HS. Life Sciences – HS. Inheritance and Variation of Traits

Nevada Academic Content Standards		Performance Indicators
HS-LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.	11.4.1

Science: HS. Physical Sciences-HS. Chemical Reactions

Nevada Academic Content Standards		Performance Indicators
HS-PS1-4	Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.	7.4.1, 7.4.2

Science: HS. Physical Sciences-HS. Energy

Nevada Academic Content Standards		Performance Indicators
HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.	6.4.2

Alignment of Animal Systems Standards and the Mathematical Practices

Mathematical Practices	Animal Systems Performance Indicators
1. Make sense of problems and persevere in solving them.	13.2.4, 15.1.1, 19.1.2, 21.1.3
2. Reason abstractly and quantitatively.	13.2.4, 15.1.1, 18.1.4, 20.1.2
3. Construct viable arguments and critique the reasoning of others.	15.1.1, 19.1.1-6, 20.1.2
4. Model with mathematics.	13.2.1, 13.2.4, 15.2.5, 19.1.2, 20.1.2, 21.1.1-4
5. Use appropriate tools strategically.	13.2.4, 15.2.5, 19.1.2, 21.1.3
6. Attend to precision.	13.2.4, 15.1.1, 19.1.2, 21.1.1-4
7. Look for and make use of structure.	13.2.1, 15.1.1
8. Look for and express regularity in repeated reasoning.	15.1.1, 19.1.1-6, 20.1.2

Alignment of Animal Systems Standards and the Science and Engineering Practices

Science and Engineering Practices	Animal Systems Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	2.2.1, 2.3.1, 6.1.2, 6.1.3, 6.1.4, 6.3.1, 6.4.2, 7.2.4, 7.3.2, 7.4.1, 8.1.3, 8.1.4, 11.1.2, 11.1.3, 11.2.3, 11.3.1, 12.1.3, 12.6.4, 13.1.3, 13.1.4, 13.1.6, 13.2.2, 13.2.3, 13.2.4, 14.1.2, 14.2.3, 14.3.2, 14.3.3, 14.3.4, 14.4.3, 15.1.1, 17.2.1, 17.2.2, 17.3.3, 17.5.3, 18.1.3, 18.1.4, 18.2.4, 18.3.3, 18.4.3, 18.5.3, 18.5.4, 18.5.5, 18.6.3, 20.1.1, 20.1.2,
2. Developing and using models.	2.1.3, 2.1.4, 5.1.3, 6.1.4, 6.2.4, 6.5.2, 7.2.3, 7.3.2, 7.4.1, 8.1.3, 11.1.3, 11.1.2, 11.2.1, 11.3.1, 11.4.4, 12.1.3, 12.2.1, 12.3.1, 12.6.4, 13.1.6, 13.2.4, 14.2.1, 15.1.1, 15.2.5, 17.3.1, 17.4.2, 17.5.3, 18.1.4, 18.1.5, 18.2.5, 18.3.4, 18.4.4, 18.5.3, 18.5.4, 18.5.5, 18.5.6, 19.1.1, 19.1.2, 20.1.1, 20.1.2,
3. Planning and carrying out investigations.	7.3.5, 12.6.4, 17.5.3
4. Analyzing and interpreting data.	11.2.3, 13.1.4, 13.1.6, 14.4.3, 15.1.1, 17.5.3,
5. Using mathematics and computational thinking.	13.2.1, 13.2.4, 15.2.5, 19.1.2, 20.1.2, 21.1.1-4
6. Constructing explanations (for science) and designing solutions (for engineering).	5.1.1, 5.1.3, 6.1.1, 6.1.2, 6.1.3, 7.1.2, 7.1.4, 7.1.6, 7.1.8, 7.2.3, 7.3.1, 11.2.2, 11.4.2, 12.3.1, 12.5.4, 13.1.1, 14.1.2, 15.2.3, 15.2.4, 17.5.1,
7. Engaging in argument from evidence.	19.1.1, 19.1.2, 19.1.3, 19.1.4, 19.1.5, 19.1.6
8. Obtaining, evaluating, and communicating information.	5.3.1, 5.3.3, 7.4.1, 8.1.3, 11.1.2, 11.4.4, 12.1.3, 13.1.4, 13.2.4, 15.1.1, 15.2.5, 16.3.2, 17.2.1, 17.5.2, 19.1.1, 19.1.2, 19.1.3, 19.1.4, 19.1.5, 19.1.6

Crosswalks of Animal Systems Standards and the Common Career Technical Core

Agricultural, Food, and Natural Resources Career Cluster	Performance Indicators
1. Analyze how issues, trends, technologies and public policies impact systems in the Agriculture, Food, and Natural Resources Career Cluster™.	2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 6.2.4, 15.1.3, 16.1.1, 16.1.2, 16.2.1, 16.2.2, 16.3.1, 16.3.2, 16.3.3, 18.1.4, 18.2.4, 18.3.3, 18.4.3, 18.5.3, 18.6.3
2. Evaluate the nature and scope of the Agriculture, Food, and Natural Resources Career Cluster™ and the role of agriculture, food, and natural resources (AFNR) in society and the economy.	2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 16.1.1, 16.1.2, 16.2.1, 16.2.2, 16.3.1, 16.3.2, 16.3.3
3. Examine and summarize the importance of health, safety, and environmental management systems in AFNR businesses.	6.5.1 6.5.2, 16.1.1, 16.1.2 16.2.1, 16.2.2, 16.3.1, 16.3.2, 16.3.3, 17.1.1, 17.1.2, 17.2.1, 17.2.2, 17.3.1, 17.3.2, 17.3.3, 17.4.1, 17.4.2, 17.4.3, 17.5.1, 17.5.2, 17.5.3
4. Demonstrate stewardship of natural resources in AFNR activities.	11.1.1, 11.1.2, 11.1.3, 11.2.1, 11.2.2, 11.2.3, 11.3.1, 11.4.1, 11.4.2, 11.4.3, 11.4.4, 11.5.1, 11.5.2,11.5.3, 20.1.1, 20.1.2
5. Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food, and Natural Resources Career Pathways.	6.6.2, 7.5.2, 8.2.2, 9.2.2, 10.3.2, 11.6.1, 11.6.2, 22.1.1
6. Analyze the interaction among AFNR systems in the production, processing and management of food, fiber and fuel and the sustainable use of natural resources.	18.1.3, 18.1.4, 18.2.4, 18.3.3, 18.4.3, 18.5.3, 18.6.3

Animal Systems Career Pathway	Performance Indicators
1. Analyze historic and current trends impacting the animal systems industry.	2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.2.1, 2.2.2, 2.2.3, 2.3.1, 2.3.2, 6.2.4, 15.1.3, 16.1.1, 16.1.2, 16.2.1, 16.2.2, 16.3.1, 16.3.2, 16.3.3, 18.1.4, 18.2.4, 18.3.3, 18.4.3, 18.5.3, 18.6.3
2. Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare.	14.2.3, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 16.1.1, 16.1.2, 16.2.1, 16.2.2, 16.3.1, 16.3.2, 16.3.3
3. Design and provide proper animal nutrition to achieve desired outcomes for performance, development, reproduction and/or economic production.	13.1.1, 13.1.2, 13.1.3, 13.1.4, 13.1.5, 13.1.6, 13.2.1, 13.2.2, 13.2.3, 13.2.4
4. Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production.	14.1.1, 14.1.2, 14.2.1, 14.2.2, 14.2.3, 14.3.1 14.3.2, 14.3.3, 14.3.4, 15.1.1, 19.1.2
5. Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance and animal health.	17.1.1, 17.1.2, 17.4.3, 17.5.1, 18.1.2, 18.2.3, 18.3.2, 18.4.2, 18.5.2, 18.6.2
6. Classify, evaluate, and select animals based on anatomical and physiological characteristics.	6.2.1, 6.2.2, 6.2.3, 6.2.4, 15.1.1, 15.1.2, 15.1.3, 15.1.4, 19.1.1, 19.1.2, 19.1.3, 19.1.4, 19.1.5, 19.1.6
7. Apply principles of effective animal health care.	17.1.1, 17.1.2, 17.2.1, 17.2.2, 17.3.1, 17.3.2, 17.3.3, 17.4.1, 17.4.2, 17.4.3, 17.5.1, 17.5.2, 17.5.3