

TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

HONORS VETERINARY SCIENCE (YEAR 1 of 2)

Grades 11-12

Regional Agriscience & Biotechnology Program

2019

Curriculum Writing Team

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Honors Veterinary Science (Year 1 of 2)
Grades 11-12
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The Trumbull Board of Education will continue to take Affirmative Action to ensure that no persons are discriminated against in its employment.

CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read and write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

Honors Veterinary Science is for those students who wish to pursue the study of veterinary science and technology as related to small animals. The course will expand on previous coursework and requires in-depth decoding, encoding, and market analysis applications which coincide with both industry standards and specific college acceptance expectations. Emphasis will be on the importance of small animals as a major phase of the animal industry. Students will be trained in practical hands-on situations using the THS demonstrational farm and small animal lab. The course will emphasize applied knowledge in livestock and small animal production as related to selection, care and management, showing, nutrition, genetics, breeding, health, anatomy, physiology, behavior, perception, training, learning, motivation, and stress, with consideration of integrated behavioral management and animal welfare, as well as opportunities in this growing field. Modern technology and a rapidly increasing rate of ownership of small animals has caused a demand for trained specialists in this area of agriculture and agribusiness. This course will offer a concentration in animal science responding to the elevated demands for an educated and experienced workforce. All students will be required to have a successful SAE (Supervised Agricultural Experience) and participate in the FFA.

Ongoing animal care and maintenance, a legal and ethical responsibility, will be a 10-15-minute part of each day, with an additional 1½-2 class periods per week spent on full cleaning.

Professionals in the field of veterinary medicine, research, and development are tasked with the care and maintenance of all body systems, from a cellular level up. To address the diversity of and varying complexities among species, Honors Veterinary Science is a two-year major course of study in Trumbull's Regional Agriscience & Biotechnology Program.

COURSE GOALS

The following course goals derive from the 2015 Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Frameworks.

AFNR.AS.01.01	Evaluate the development and implications of animal origin, domestication, and distribution on production practices and the environment.
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AFNR.AS.01.02	Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.
AFNR.AS.02.01	Demonstrate management techniques that ensure animal welfare.
AFNR.AS.02.02	Analyze procedures to ensure that animal products are safe for consumption (e.g., use in food system, etc.).
AFNR.AS.03.01	Analyze the nutritional needs of animals.
AFNR.AS.03.02	Analyze feed rations and assess if they meet the nutritional needs of animals.
AFNR.AS.05.01	Design animal housing, equipment, and handling facilities for the major systems of animal production.
AFNR.AS.06.02	Apply principles of comparative anatomy and physiology to uses within various animal systems.
AFNR.AS.06.03	Select and train animals for specific purposes and maximum performance based on anatomy and physiology.
AFNR.AS.07.01	Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.
AFNR.AS.07.02	Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national, and global level.
AFNR.AS.08.02	Evaluate the effects of environmental conditions on animals and create plans to ensure favorable environments for animals.
AFNR.BS.02.01	Read, document, evaluate, and secure accurate laboratory records of experimental protocols, observations, and results.
AFNR.BS.02.03	Apply standard operating procedures for the safe handling of biological and chemical materials in a laboratory.
AFNR.BS.02.04	Safely manage and dispose of biological materials, chemicals, and wastes according to standard operating procedures.
AFNR.CRP.01.01	Model personal responsibility in the workplace and community.
AFNR.CRP.02.01	Use strategic thinking to connect and apply academic learning, knowledge, and skills to solve problems in the workplace and community.
AFNR.CRP.02.02	Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.

AFNR.CRP.04.01	Speak using strategies that ensure clarity, logic, purpose, and professionalism in formal and informal settings.
AFNR.CRP.04.02	Produce clear, reasoned, and coherent written and visual communication in formal and informal settings.
AFNR.CRP.04.03	Model active listening strategies when interacting with others in formal and informal settings.
AFNR.CRP.06.01	Synthesize information, knowledge, and experience to generate original ideas and challenge assumptions in the workplace and community.
AFNR.CRP.06.02	Assess a variety of workplace and community situations to identify ways to add value and improve the efficiency of processes and procedures.
AFNR.CRP.06.03	Create and execute a plan of action to act upon new ideas and introduce innovations to workplace and community organizations.
AFNR.CRP.07.02	Evaluate the validity of sources and data used when considering the adoption of new technologies, practices, and ideas in the workplace and community.
AFNR.CRP.08.01	Apply reason and logic to evaluate workplace and community situations from multiple perspectives.
AFNR.CRP.08.02	Investigate, prioritize, and select solutions to solve problems in the workplace and community.
AFNR.CRP.08.03	Establish plans to solve workplace and community problems and execute them with resiliency.
AFNR.CRP.09.02	Implement personal management skills to function effectively and efficiently in the workplace (e.g., time management, planning, prioritizing, etc.).
AFNR.CRP.09.03	Demonstrate behaviors that contribute to a positive morale and culture in the workplace and community (e.g., positively influencing others, effectively communicating, etc.).
AFNR.CRP.12.01	Contribute to team-oriented projects and build consensus to accomplish results using cultural global competence in the workplace and community.
AFNR.CRP.12.02	Create and implement strategies to engage team members to work toward team and organizational goals in a variety of workplace and community situations (e.g., meetings, presentations, etc.).

AFNR.CS.01.01	Research, examine, and discuss issues and trends that impact AFNR systems on local, state, national and global levels.
AFNR.CS.01.03	Identify public policies and examine their impact on AFNR systems.
AFNR.CS.02.01	Research and use geographic and economic data to solve problems in AFNR systems.
AFNR.CS.03.01	Identify and explain the implications of required regulations to maintain and improve safety, health and environmental management systems.
AFNR.CS.03.04	Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.

The following course goals derive from the 2010 Connecticut Core Standards.

CCS.ELA-Literacy.RST.11-12.1	Cite specific technical 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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.

CCS.ELA-Literacy.WHST.11-12.1.a	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
CCS.ELA-Literacy.WHST.11-12.2.d	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.
CCS.ELA-Literacy.WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.
CCS.ELA-Literacy.SL.11-12.1.c	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.

CCS.ELA-Literacy.SL.11-12.1.d	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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.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.
CCS.ELA-Literacy.SL.11-12.6	Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

The following course goals derive from the 2013 Next-Generation Science Standards.

NGSS.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.
NGSS.HS.LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
NGSS.HS.LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
NGSS.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.
NGSS.HS.LS2-6	Evaluate 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.
NGSS.HS.LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

NGSS.HS.LS2-8	Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.
NGSS.HS.LS4-4	Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
NGSS.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.

The following course goal derives from the 2016 International Society for Technology in Education Standards.

ISTE Knowledge Constructor (Standard 3)	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.
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COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .

- the small industry is growing exponentially, and thus the knowledge small animals employees must acquire is at an all-time high.
- basic animal behavior, basic animal needs, and basic medical and anatomical terminology related to small animals must be interpreted and addressed safely.
- the body systems of small animals are interconnected in complex ways.

COURSE ESSENTIAL QUESTION

- What knowledge and experience is necessary to work in the field of veterinary science?

COURSE KNOWLEDGE & SKILLS

Students will know . . .

- essential information in the field of veterinary science and related animal-based professions.

Students will be able to . . .

- work safely and knowledgeably within the field of veterinary science.

COURSE SYLLABUS

Course Name

Honors Veterinary Science

Level

Honors; Grades 11-12

Prerequisites

Successful completion of Agriscience 9 and 10

Materials Required

None

General Description of the Course

This course is for those students who wish to pursue the study of veterinary science and technology as related to small animals. The course will expand on previous coursework and requires in-depth decoding, encoding, and market analysis applications which coincide with both industry standards and specific college acceptance expectations. Emphasis will be on the importance of small animals as a major phase of the animal industry. Students will be trained in practical hands-on situations using the THS demonstrational farm and small animal lab. The course will emphasize applied knowledge in livestock and small animal production as related to selection, care and management, showing, nutrition, genetics, breeding, health, anatomy, physiology, behavior, perception, training, learning, motivation, and stress, with consideration of integrated behavioral management and animal welfare, as well as opportunities in this growing field. Modern technology and a rapidly increasing rate of ownership of small animals has caused a demand for trained specialists in this area of agriculture and agribusiness. This course will offer a concentration in animal science responding to the elevated demands for an educated and experienced workforce. All students will be required to have a successful SAE (Supervised Agricultural Experience) and participate in the FFA.

Assured Assessments

Formative Assessments:

- Worksheets, guided activities, writing assignments, (Units 1, 2, 3, 4, 5, 6, 8, 9, 10)
- Application of physical skills (Unit 1)
- Case studies (Units 2, 3, 4, 5, 6, 8, 9, 10)
- Written identification of key veterinary terminology, common abbreviations, and applications (Unit 4)
- “Most Wanted” poster (Unit 5)
- Culturing of various types of bacteria (Unit 5)
- Treatment plans for animals (Unit 5)
- Research, and poster creation, related to a particular disease (Unit 6)
- Group oral presentation (Unit 6)
- Design of disease control program (Unit 6)
- One-page writing describing the cascade effect (Unit 7)

- Performance of a skin scraping (Unit 8)
- Use of a microscope (Unit 8)
- Collection of hair samples (Unit 8)
- Written/oral explanation for commonly diagnosed issue (Unit 8)
- Development of an original engineered design (Unit 9)
- Building of the musculoskeletal system out of pasta (Unit 10)
- Sketching of microscopic differences (Unit 10)

Summative Assessments:

- Written assessments (Units 1, 2, 3, 4, 5, 6, 8, 9, 10)
- Hands-on demonstration of physical skills (Unit 1)
- Patient diagnosis based on a case study (Units 6, 8, 9, 10)

Core Text

Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.

UNIT 1

Personal Safety and Animal Handling

Unit Goals

At the completion of this unit, students will:

AFNR.AS.02.02	Define and understand OSHA and workplace safety laws and types of hazards in the workplace.
AFNR.AS.07.01	
AFNR.CRP.01.01	
AFNR.CRP.06.02	
AFNR.CS.01.01	
AFNR.CS.03.01	
AFNR.CS.03.04	
CCS.ELA-Literacy.RST.11-12.1	
AFNR.AS.02.01	Demonstrate understanding of forms of handling and restraining large, small, and exotic animals.
CCS.ELA-Literacy.WHST.11-12.4	
CCS.ELA-Literacy.SL.11-12.4	
CCS.ELA-Literacy.SL.11-12.6	
ISTE Knowledge Constructor (Standard 3)	

Unit Essential Questions

- What are an employee's rights on the job, and how can students stay safe in the workplace environment?
- How can I stay safe when working with or as a veterinarian?
- What can proper handwashing protect employees from hazards?
- Why are Safety Data Sheets important in a veterinary hospital?
- What is the Globally Harmonized System (GHS), and how is it helpful?
- How can I safely halter a variety of livestock?
- Why is it important to use the appropriate knot in the veterinary setting?
- Why is observing and knowing animal behavior, movement, and communication important in veterinary medicine?

Scope and Sequence

- OSHA: Occupational Safety and Health Administration
- Hazards in the workplace
 - Safety signs and symbols and Personal Protective Equipment
 - Hazards
 - Hand Washing (scrubbing-in for surgical procedures)
 - Safety Data Sheets
 - Hazard analysis
- Handling and restraint for large, small, and exotic animals
 - Haltering livestock
 - Knot-tying

- Animal behavior and communication
- Restraint techniques and equipment

Assured Assessments

Formative Assessments:

- Worksheets, guided activities, writing assignments, and application of physical skills related to demonstrating forms of handling and restraining large, small, and exotic animals

Summative Assessment:

- Written assessment with various question types
- Hands-on demonstration of physical skills related to demonstrating forms of handling and restraining large, small, and exotic animals

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 1-2 weeks

UNIT 2

Animal Roles in Society

Unit Goals

At the completion of this unit, students will:

AFNR.AS.01.01
CCS.ELA-Literacy.RST.11-12.1

Identify and describe the changing roles in society of companion animals, production animals, service animals, exotics, backyard animals, and research animals.

AFNR.AS.01.01
AFNR.AS.01.02
AFNR.CRP.04.02
CCS.ELA-Literacy.SL.11-12.6

Discuss the animal sporting industry.

AFNR.AS.01.01
AFNR.AS.01.02
CCS.ELA-Literacy.WHST.11-12.6
CCS.ELA-Literacy.SL.11-12.6
ISTE Knowledge Constructor (Standard 3)

Discuss and analyze various aspects of wildlife management.

Unit Essential Questions

- What is the role of animals in society?
- What shapes people's views about an animal's role?
- How can we modify veterinary practices to minimize fear and discomfort?

Scope and Sequence

- The roles and uses of animals in society
- Shifting perspectives of animals: Case study of Dr. Temple Grandin

Assured Assessments

Formative Assessments:

- Worksheets, guided activities, writing assignments, and case studies

Summative Assessment:

- Written assessment with various question types, including analysis of various case studies

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 2 weeks

UNIT 3

Issues in the Animal Industry

Unit Goals

At the completion of this unit, students will:

AFNR.AS.02.02 AFNR.CRP.09.02 CCS.ELA-Literacy.WHST.11-12.9	Describe the influence of the consumer in the animal agriculture industry.
AFNR.CRP.12.01 AFNR.CS.01.01 CCS.ELA-Literacy.SL.11-12.1.d ISTE Knowledge Constructor (Standard 3)	Compare and contrast animal rights and animal welfare groups.
AFNR.AS.02.01 CCS.ELA-Literacy.RST.11-12.7 CCS.ELA-Literacy.SL.11-12.4	Recognize and discuss the human-animal bond and its relationship with euthanasia of animals.
CCS.ELA-Literacy.WHST.11-12.2.d CCS.ELA-Literacy.SL.11-12.4	Discuss the characteristics that influence whether an animal is a companion animal or a production animal.

Unit Essential Questions

- When I purchase food at the store, what type of labeling (e.g., “organic,” “grass-fed,” “free-range”) should I consider?
- What is the difference between a need and a want in life?
- What role does a pet play in my family?
- Are the same animals considered companion animals in every culture?

Scope and Sequence

- Consumers in the animal agriculture industry
- Animal rights vs. animal welfare
 - The debate between animal rights and animal welfare
 - Humane law enforcement relating to animals
- The human-animal bond
 - Financial responsibility
 - Disaster preparedness
- Euthanasia of animals
- Companion animals vs. production animals

Assured Assessments

Formative Assessments:

- Worksheets, guided activities, writing assignments, and case studies

Summative Assessment:

- Written assessment with various question types, including analysis of various case studies

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 4 weeks

UNIT 4

Veterinary Terminology

Unit Goals

At the completion of this unit, students will:

CCS.ELA-Literacy.RST.11-12.9	Identify prefixes, suffixes, and roots in terminology that has an impact on the veterinary industry.
CCS.ELA-Literacy.RST.11-12.7	Define key veterinary terminology, along with common abbreviations for that terminology.
AFNR.BS.02.01	Convert weights and measures commonly used in the veterinary industry.
AFNR.AS.06.02 AFNR.AS.06.03 AFNR.BS.02.01 AFNR.CS.01.01 ISTE Knowledge Constructor (Standard 3)	Relate a knowledge of key veterinary terminology to routine veterinary practices.

Unit Essential Questions

- How have prefixes, suffixes, and roots developed terminology that has an impact on the veterinary industry?
- How can an understanding of Latin names, adjectives, and gender terms make an employee more valuable in the veterinary industry?
- How does an understanding of directional terminology allow for better care for animals in an animal hospital?

Scope and Sequence

- The “ologies” of veterinary science
- The science of veterinary terminology: prefixes, roots, and suffixes
- Common veterinary abbreviations
- Recognition of species through terminology
- Anatomical and positional terminology
- Conversions in the veterinary hospital: Classical conversions

Assured Assessments

Formative Assessments:

- Written identification of key veterinary terminology and common abbreviations, and application of those to routine veterinary practices
- Worksheets, guided activities, writing assignments, and case studies

Summative Assessment:

- Written assessment with various question types, including analysis of various case studies

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

UNIT 5

Microbiology

Unit Goals

At the completion of this unit, students will:

AFNR.BS.02.03
AFNR.BS.02.04
NGSS.HS.LS1-1

Define microbiology, and identify types of microbes using diagnostic tools.

AFNR.AS.07.01
AFNR.CRP.02.01
AFNR.CRP.06.01
AFNR.CRP.08.01
AFNR.CS.01.01
CCS.ELA-Literacy.WHST.11-12.1.a
CCS.ELA-Literacy.WHST.11-12.7
CCS.ELA-Literacy.WHST.11-12.8
NGSS.HS.LS1-3
NGSS.HS.LS2-6
ISTE Knowledge Constructor (Standard 3)

Apply the shift in relationship from symbiotic to opportunistic, utilizing microbiological principles to prevent the spread of disease.

AFNR.AS.03.01
CCS.ELA-Literacy.RST.11-12.7
CCS.ELA-Literacy.WHST.11-12.2.d
CCS.ELA-Literacy.WHST.11-12.4
CCS.ELA-Literacy.SL.11-12.1.c

Develop treatment plans for animals affected by harmful microbes.

Unit Essential Questions

- What microbes live on and/or in one's body, and to what extent are they good or bad?
- How have microbes contributed to the evolution of the food chain niches inhabited by both carnivores and herbivores?
- How can a microscope be used as a diagnostic tool in a veterinary hospital?
- What type of diagnostic procedure might be performed to determine if a disease is viral or bacterial?
- How does the veterinary specialist determine the best antibiotic for a bacterial infection?

Scope and Sequence

- Microbiology fundamentals
 - Microorganisms as natural inhabitants of the environment
 - The oil immersion microscope as an important diagnostic tool
- Types of microbes
- Relationship of microbes in the body
- Diagnostic tools
 - Inoculation

- Skin scrapings and dermatophyte collections
- Ear, nasal, and skin swabbing
- Preventing infection
- Careers in microbiology

Assured Assessments

Formative Assessments:

- “Most Wanted” poster based on an assigned microbe
- Culturing of various types of bacteria in animals and in environments surrounding animals
- Treatment plans for animals affected by harmful microbes
- Worksheets, guided activities, writing assignments, and case studies

Summative Assessment:

- Written assessment with various question types, including analysis of various case studies

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

UNIT 6

Biosecurity

Unit Goals

At the completion of this unit, students will:

AFNR.AS.02.02
AFNR.AS.03.02
AFNR.AS.08.02
AFNR.CRP.01.01
AFNR.CS.01.01
AFNR.CS.02.01
NGSS.HS.LS1-3

Identify and differentiate among disease-causing organisms, recognize zoonotic diseases, and assess and predict risks associated with zoonotic diseases.

AFNR.AS.06.02
AFNR.CRP.04.01
AFNR.CRP.04.02
AFNR.CRP.04.03
CCS.ELA-Literacy.WHST.11-12.2.d
CCS.ELA-Literacy.WHST.11-12.4
NGSS.HS.LS4-4

Compare and contrast healthy and sick animals.

AFNR.AS.01.02
AFNR.AS.02.01
AFNR.AS.05.01
AFNR.AS.07.01
AFNR.AS.07.02
AFNR.CRP.02.02
AFNR.CRP.06.03
AFNR.CRP.08.03
AFNR.CRP.12.02
AFNR.CS.01.03
CCS.ELA-Literacy.RST.11-12.2
CCS.ELA-Literacy.RST.11-12.7
CCS.ELA-Literacy.RST.11-12.9
CCS.ELA-Literacy.WHST.11-12.1.a
CCS.ELA-Literacy.WHST.11-12.7
CCS.ELA-Literacy.WHST.11-12.8
CCS.ELA-Literacy.SL.11-12.2
NGSS.HS.LS2-2
NGSS.HS.LS2-7
NGSS.HS.LS2-8
ISTE Knowledge Constructor (Standard 3)

Assess factors and risks related to biosecurity and public safety.

Unit Essential Questions

- Why are new animals quarantined before being introduced into a herd?

- In terms of food producers, food processors, and food consumers, why has there been little progress made in reducing the incidence of foodborne illness in people?
- What could be changed to effectively decrease the incidence of foodborne illness?

Scope and Sequence

- Disease-causing organisms
 - Clinical signs and symptoms of common diseases
 - Different modes of disease transmission
 - Zoonotic diseases
 - Assessing sick vs. healthy animals
- Biosecurity, pathogen control, and associated human and animal risks
 - Safety practices and procedures to control the spread of pathogenic agents in the environment
 - Improper use of antibiotics leading to resistance
 - Roles of producer, processor, and consumer in biosecurity to control the spread of disease
 - Pathogenic control throughout the world
 - Good biosecurity plans minimizing risks to animals and humans
- Impacts of biosecurity
 - Consumer decisions playing a role in market production
 - Pathogenic outbreaks impacting local, state, national, and global economies
 - Mass slaughter of animals to halt epidemics
 - Good biosecurity practices minimizing risks to humans from zoonotic diseases and adulterated food
- Careers in biosecurity

Assured Assessments

Formative Assessments:

- Research, and poster creation, related to a particular disease and its cause, mode of transmission, prevention, and treatment
- Group oral presentation related to potential hazards in a processing facility, and effective actions for remediation of those hazards
- Design of disease control program for a fictitious outbreak of a specific disease
- Worksheets, guided activities, writing assignments, and case studies

Summative Assessments:

- Written assessment with various question types
- Patient diagnosis based on a case study

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

UNIT 7

Interconnectedness of Body Systems

Unit Goals

At the completion of this unit, students will:

CCS.ELA-Literacy.RST.11-12.3	Recognize the complexity of relationships among body systems, including how body systems function in a coordinated fashion to maintain homeostasis.
AFNR.CRP.04.02	
NGSS.HS.LS1-3	
ISTE Knowledge Constructor (Standard 3)	

Unit Essential Questions

- If one body system is not functioning properly, how might that affect other body systems?

Scope and Sequence

- Body systems working together to maintain homeostasis

Assured Assessments

Formative Assessment:

- One-page writing describing the cascade effect of how problems with one body system eventually affect other body systems

Summative Assessment:

- [Integrated into the study of other body systems in future units]

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.

Supplemental

- industry-related print or online magazine or journal articles
- online video resources
- case studies

Time Allotment

- Approximately 1 week

UNIT 8

Integumentary System

Unit Goals

At the completion of this unit, students will:

AFNR.CRP.09.02	Identify the gross and cellular structures of the integumentary system.
CCS.ELA-Literacy.WHST.11-12.2.d CCS.ELA-Literacy.WHST.11-12.4 ISTE Knowledge Constructor (Standard 3)	Analyze the purpose and function of the integumentary system, explaining how the structures relate to their functions.
AFNR.AS.06.02 AFNR.AS.07.01 AFNR.CRP.12.01 AFNR.CS.01.01	Apply their knowledge of normal function of the integumentary system to assess abnormal changes and diseases and determine possible diagnoses and treatments.

Unit Essential Questions

- What are the functions of the skin?
- What is the basic structure of skin in different species?
- How and why can hair differ among species?
- What are some common ailments of the integumentary system, and how are integumentary problems diagnosed?

Scope and Sequence

- Anatomy and physiology
 - Integumentary system
 - Hair anatomy
- Skin diseases

Assured Assessments

Formative Assessments:

- Performance of a skin scraping
- Use of a microscope to view various skin cells from various species in the lab and on the farm
- Collection of hair samples from a variety of species, viewing of the samples under the microscope, and documentation of the findings
- Written/oral explanation of signs/symptoms, mode of transference, method of diagnosis, and treatment plan for a commonly diagnosed issue with the integumentary system
- Worksheets, guided activities, writing assignments, and case studies

Summative Assessments:

- Written assessment with various question types
- Patient diagnosis based on a case study including an integumentary abnormality

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

UNIT 9

Purpose, Function, Skeletal System Parts

Unit Goals

At the completion of this unit, students will:

AFNR.CRP.01.01 AFNR.CS.03.04 NGSS.HS.LS1-1	Identify the gross and cellular structures of the skeletal system, as well as the common external anatomical sites of animals.
AFNR.AS.06.03 AFNR.CRP.04.01 AFNR.CRP.04.03 CCS.ELA-Literacy.RST.11-12.7 CCS.ELA-Literacy.RST.11-12.9 NGSS.HS.LS1-2 ISTE Knowledge Constructor (Standard 3)	Analyze the purpose and function of the skeletal system, comparing skeletal structures of different species, and explaining how the structures relate to their functions.
AFNR.AS.06.02 AFNR.CRP.07.02 AFNR.CRP.08.01 AFNR.CRP.08.02 CCS.ELA-Literacy.RST.11-12.8 NGSS.HS.ETS1-2	Apply their knowledge of normal function of the skeletal system to assess abnormal changes and determine possible interventions.

Unit Essential Questions

- What makes a bone a bone?
- What are similarities and differences between bones in different species?
- To what extent do different bones serve different purposes in the body?
- What is the role of evolution in terms of skeletal development?
- How is it possible to determine what an animal eats based on the teeth that are in the animal's mouth?
- How can bones be fixed in the least invasive way?
- What role do joints, ligaments, and tendons play in locomotion, and what are the differences among these structures?

Scope and Sequence

- Purpose, function, skeletal system parts
- Bone development and structure
- Common names for animal parts: Comparative anatomy
- Dental structures of animals
- Skeletal malfunctions: Bone breaks and repairs
- Skeletal disease and genetic issues
- Skeleton and body movement

Assured Assessments

Formative Assessments:

- Development of an original engineered (“make-shift”) design to help repair a foam bone
- Worksheets, guided activities, writing assignments, and case studies

Summative Assessments:

- Written assessment with various question types
- Patient diagnosis based on a case study including a skeletal abnormality that can be observed externally as well as internally (e.g., through radiographs)

Resources

Core

- Martinec, Elizabeth. *Veterinary Science 9-12: The Classroom Curriculum*. 2nd ed. Ithaca, NY: Cornell University, n.d. Print.
- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

- case studies

Supplemental

- industry-related print or online magazine or journal articles
- online video resources

Time Allotment

- Approximately 3 weeks

SUPERVISED AGRICULTURAL EXPERIENCE (SAE)

To be successful in tomorrow's workplace and life, students need planned, supervised, work-based applications of concepts and skills learned in agricultural education instruction.

Research has shown that participation in Supervised Agricultural Experiences has a positive effect on students and correlates to career maturity. According to Dr. Walter Edling, vice president and chief education specialist at the Center for Occupational Research and Development in Waco, Texas, most people learn best through experience. This may involve personal participation, physical or hands-on activities, and opportunities for personal discovery. Edling also says that learning is enhanced when concepts are presented in a context using familiar relationships, and that most people relate better to concrete, tangible examples and experiences as opposed to abstract, conceptual models.

SAEs make learning relevant. Instead of just talking about agriculture or the environment, students learn by conducting experiments, working in a greenhouse or agribusiness, or raising animals and plants.

Work-based learning experiences such as SAEs prepare students for useful, interesting, and challenging careers. Over the next five years, there will be a five percent shortage of qualified graduates to enter key food, fiber, and natural resources occupations. There are many extraordinary opportunities in the emerging technology fields such as biotechnology. SAEs, an integral part of successful agricultural education programs, offer students a competitive advantage.

In grades 11 and 12, the SAE is integrated into all four marking periods, approximately two days per marking period.

FFA/LEADERSHIP

The FFA youth organization is an integral part of the Agriscience Program. Through various activities, students develop skills in leadership and personal growth. They practice the leadership and human relations skills that are critical for personal growth and career success. They demonstrate interpersonal skills in teamwork, communications, human relations, and social interactions. The student experience is based on the FFA model, which provides incentives and recognition for outstanding achievement.

In grades 11 and 12, the FFA/Leadership component is integrated into all four marking periods, with students participating in FFA meetings, leadership workshops, Agriscience field trips, fundraising activities, and other events sponsored by the Agriscience program. FFA/Leadership participation is ten percent of a student's grade each marking period, based on the following criteria: Students will attend one Chapter FFA meeting, and participate in two Agriscience-sponsored activities each marking period.

The FFA/Leadership component allows students to explore styles of leadership and qualities of successful leaders. They practice communication, problem-solving, and decision-making skills while learning about their role in organizing and maintaining a successful FFA Chapter and in planning and conducting their Supervised Agricultural Experience.

COURSE CREDIT

Two credits each year
Two class periods daily for each full year

PREREQUISITES

Successful completion of Agriscience 9 and 10.

ASSURED STUDENT PERFORMANCE RUBRICS

- Trumbull High School School-Wide Writing Rubric (attached)
- Trumbull High School School-Wide Problem-Solving Rubric (attached)
- Trumbull High School School-Wide Independent Learning and Thinking Rubric (attached)

Trumbull High School School-Wide Writing Rubric

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	<ul style="list-style-type: none"> • Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task 	<ul style="list-style-type: none"> • Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task 	<ul style="list-style-type: none"> • Establishes a purpose • Demonstrates an awareness of audience and task 	<ul style="list-style-type: none"> • Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	<ul style="list-style-type: none"> • Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions 	<ul style="list-style-type: none"> • Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions 	<ul style="list-style-type: none"> • Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions 	<ul style="list-style-type: none"> • Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	<ul style="list-style-type: none"> • Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples 	<ul style="list-style-type: none"> • Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples 	<ul style="list-style-type: none"> • May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples 	<ul style="list-style-type: none"> • Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	<ul style="list-style-type: none"> • Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning 	<ul style="list-style-type: none"> • Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning 	<ul style="list-style-type: none"> • Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning 	<ul style="list-style-type: none"> • Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Trumbull High School School-Wide Problem-Solving Rubric

Category/ Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	<ul style="list-style-type: none"> Student demonstrates clear understanding of the problem and the complexities of the task. 	<ul style="list-style-type: none"> Student demonstrates sufficient understanding of the problem and most of the complexities of the task. 	<ul style="list-style-type: none"> Student demonstrates some understanding of the problem but requires assistance to complete the task. 	<ul style="list-style-type: none"> Student demonstrates limited or no understanding of the fundamental problem after assistance with the task.
Research X_____	<ul style="list-style-type: none"> Student gathers compelling information from multiple sources including digital, print, and interpersonal. 	<ul style="list-style-type: none"> Student gathers sufficient information from multiple sources including digital, print, and interpersonal. 	<ul style="list-style-type: none"> Student gathers some information from few sources including digital, print, and interpersonal. 	<ul style="list-style-type: none"> Student gathers limited or no information.
Reasoning and Strategies X_____	<ul style="list-style-type: none"> Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies. 	<ul style="list-style-type: none"> Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies. 	<ul style="list-style-type: none"> Student demonstrates some critical thinking skills to develop a plan integrating some strategies. 	<ul style="list-style-type: none"> Student demonstrates limited or no critical thinking skills and no plan.
Final Product and/or Presentation X_____	<ul style="list-style-type: none"> Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st-century technology skills. 	<ul style="list-style-type: none"> Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st-century technology skills. 	<ul style="list-style-type: none"> Solution shows some understanding of the problem and its components. Solution shows some use of 21st-century technology skills. 	<ul style="list-style-type: none"> Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st-century technology skills.

Trumbull High School School-Wide Independent Learning and Thinking Rubric

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	<ul style="list-style-type: none"> • Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work. 	<ul style="list-style-type: none"> • Student demonstrates initiative by generating appropriate questions, creating original projects/work. 	<ul style="list-style-type: none"> • Student demonstrates some initiative by generating questions, creating appropriate projects/work. 	<ul style="list-style-type: none"> • Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	<ul style="list-style-type: none"> • Student is analytical, insightful, and works independently to reach a solution. 	<ul style="list-style-type: none"> • Student is analytical, and works productively to reach a solution. 	<ul style="list-style-type: none"> • Student reaches a solution with direction. 	<ul style="list-style-type: none"> • Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	<ul style="list-style-type: none"> • Presentation shows compelling evidence of an independent learner and thinker. • Solution shows deep understanding of the problem and its components. • Solution shows extensive and appropriate application of 21st-century skills. 	<ul style="list-style-type: none"> • Presentation shows clear evidence of an independent learner and thinker. • Solution shows adequate understanding of the problem and its components. • Solution shows adequate application of 21st-century skills. 	<ul style="list-style-type: none"> • Presentation shows some evidence of an independent learner and thinker. • Solution shows some understanding of the problem and its components. • Solution shows some application of 21st-century skills. 	<ul style="list-style-type: none"> • Presentation shows limited or no evidence of an independent learner and thinker. • Solution shows limited or no understanding of the problem. • Solution shows limited or no application of 21st-century skills.