
Pre-Veterinary Science

Curriculum Map

School Year: 2022-2023

School: Southern Cayuga Jr./Sr. High School

Program: Agricultural Sciences

Teacher: Ms. Wasson

Course Rationale:

This is designed to expose students to agriculture, animal science, and related career options. Students participating in the course will have experiences in various animal science concepts with hands-on activities, projects, and problems. Students' experiences will involve the study of animal anatomy, physiology, behavior, nutrition, reproduction, health, selection, and marketing. For example, students will acquire skills in meeting the nutritional needs of animals while developing balanced, economical rations. Throughout the course, students will consider the perceptions and preferences of individuals within local, regional, and world markets. Students will explore hands-on projects and activities to learn the characteristics of animal science and work on major projects and problems similar to those that animal science specialists, such as veterinarians, zoologists, livestock producers, and industry personnel, face in their respective careers.

Standards:

Life Science

LS1.A: Structure and Function

LS1.B: Growth and Development of Organisms

LS1.C: Organization for Matter and Energy Flow in Organisms

LS2.A: Interdependent Relationships in Ecosystems

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

LS2.D: Social Interactions and Group Behavior

LS3.A: Inheritance of Traits

LS3.B: Variation of Traits

LS4.A: Evidence of Common Ancestry and Diversity

LS4.C: Adaptation

LS4.D: Biodiversity and Humans

English Language Arts

RL.9-10.1: Cite strong and thorough textual evidence to support analysis of what

the text says explicitly as well as inferences drawn from the text.

RL.9-10.2: Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

RL.9-10.4: Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone

Course Outline:

Title or Topics / Essential Questions	Content Skills (Activities to cover Essential Questions)	Vocabulary	Major Assessments	Time Frame
<p>Personal Safety and Precautions</p> <p>What types of hazards are common in a veterinary hospital?</p> <p>Why is it important to identify and recognize where safety equipment is located?</p> <p>Why was OSHA created?</p> <p>How can you stay safe while working with or as a veterinarian around animals?</p> <p>What are Zoonotic diseases?</p>	<p>Identify the types of hazards common in the veterinary hospital and the organization that regulates safety standards in the workplace.</p> <p>Review an MSDS and locate important safety information within it.</p> <p>Determine how to protect one's self from potential hazards in the workplace.</p> <p>Describe the correct methods of protection given scenarios describing hazardous situations.</p> <p>Research zoonotic diseases.</p> <p>Investigate the differences between sanitation, disinfection, and Sterilization.</p>	<p>Aseptic, Biohazard, Biological Hazard, Chemical Hazard, Communication, Contamination, Dilution, Disinfectant, Elimination, Ergonomic Hazard, Exposure, Flammable, GHS, Hazard, Harmful, Microorganism, NIOSH, OSHA, Pathogen, PPE, Physical Hazard, Precautions, Radioactive, Safety Data Sheets, Safety Hazard, Sharps, Toxicity, and Workplace Organization Hazard.</p> <p>Collaborate, Determine, Explain, Identify, and Interpret.</p>	<p>A.1.1 Post-test: The Role of OSHA</p> <p>A.2.1 Post-test: Safety Signs, Symbols and PPE</p> <p>A.2.3 Glow-Germ Hand Washing Lab</p> <p>Evaluation Rubric: Performing a Surgical Scrub</p> <p>Evaluation: Safety Data Sheets</p> <p>Post-test Questions: Safety Data Sheets</p> <p>Evaluation Rubric: Hazard Mapping</p> <p>A.2.5 Post-test: Hazard Analysis</p>	<p>3 - 4 Weeks</p>
<p>Microbiology</p> <p>What is microbiology?</p>	<p>Define Microbiology.</p>	<p>Aerobic, Asexual Reproduction, Asymptomatic,</p>	<p>F.1.1 Post-test: What Is Microbiology?</p>	<p>4 - 5 Weeks</p>
<p>How would a microscope be used as a diagnostic tool in a veterinary hospital?</p>	<p>Identify types of microbes through diagnostic tools.</p> <p>Apply the shift in relationship from symbiotic to opportunistic.</p>	<p>Bacteriology, Binomial Nomenclature, Budding, Cellulose, Chlorophyll, Chloroplast, Cilia, Coliform Bacteria, Commensalism, DNA,</p>	<p>F.1.2 Evaluation Rubric: Microscope Use</p> <p>F.1.2 Post-test: Using an Oil Immersion Microscope</p>	

<p>What characterizes an organism to be living?</p> <p>How have microbes contributed to the evolution of the food chain niches that these animals inhabit?</p>	<p>Explain how pathogens may contaminate food and water sources and create public safety concerns.</p> <p>Utilize the microbiology principles to prevent the spread of disease.</p>	<p>E. Coli, Eukaryote, Fermentation, Flora, Gross Evaluation, Host, Microbiology, Microbiologist, Morphology, Mutualism, Parasitism, Prokaryote, RNA, Salmonella, Symbiosis, and Taxonomy.</p>	<p>F.2.1 Evaluation Rubric: Creating a Gram-Stained Slide</p> <p>F.2.1 Post-test: Microbe Identification</p> <p>F.3.1 Post-test Questions: Microbial Relationships</p>	
<p>Biosecurity</p> <p>How does an “outbreak” occur?</p> <p>What type of diseases can be spread from animals to humans?</p> <p>Why is it important to take an antibiotic as prescribed?</p> <p>How might biosecurity differ for two types of animal production systems?</p>	<p>Identify and differentiate between disease-causing organisms.</p> <p>Recognize zoonotic diseases.</p> <p>Assess and predict risks associated with zoonotic diseases.</p> <p>Compare and contrast healthy and sick animals.</p> <p>Extrapolate reasoning improper use of antibiotics can lead to resistance.</p> <p>Assess risks related to biosecurity and public safety.</p>	<p>Antimicrobial, APHIS, Biosecurity, CAFO, Carrier, Cross-Protection, Diagnosis, Diffusely, Endemic, Euthanasia, Fomite, GDP, GNI, HACCP, Husbandry, Indemnity, Infectious Disease, Mitigation, Morbidity, Morality, Necropsy, NGO, Prevalence, Prevention, Proactive, prognosis, Quarantine, Reservoir, USDA, Vector, and Zoonotic.</p>	<p>G 1.1 Case Studies: Animal Disease</p> <p>G.1.1 Post-test: Common Signs & Symptoms Disease</p> <p>G.1.2. Evaluation Rubric: Disease Transmission</p> <p>Post-test: Zoonotic Diseases</p> <p>Post-test: Sick Versus Healthy Animals</p> <p>G.2.2. Evaluation Rubric: Antibiotic Resistance</p>	<p>4 – 5 Weeks</p>
<p>Skeletal, Muscular, and Nervous Systems</p> <p>Do different bones serve different purposes in the body?</p> <p>How would movement be different without joints, ligaments and tendons?</p> <p>How do bones and muscle work</p>	<p>Identify of bones, bone structure and bone location is essential to develop a total understanding of the skeletal system and general body supporting structure.</p> <p>Determine how joints, ligaments and tendons allow the bone components of a skeletal system to work together for body movement and support.</p> <p>Recognize the anatomy and types of muscle.</p>	<p>Appendicular Skeleton, Axial Skeleton, Cartilage, Central Nervous System, Cerebellum, Cerebrum, Diaphysis, Endoskeleton, Efferent, Epiphysis, Exoskeleton, Fascicle, Histology, Hypothalamus, Insertion, Joint, Ligament, Medulla Oblongata, Nerves, Neuron, Origin, Synapse, Tendon, Thalamus, TSH, and</p>	<p>J.1.1 Evaluation Rubric: Building a Pasta Skeleton w/ muscles project</p> <p>J.7.1 Evaluation Rubric: Chicken Wing Dissection</p> <p>K.1.1 Post-test Questions: Muscular System</p> <p>L.1.1 Evaluation Rubric: Brain</p>	<p>5 - 6 Weeks</p>

together to allow movement? How does the nervous system interact with other body systems?	Describe how the nervous system interacts with all other body systems for both voluntary motor function and involuntary autonomic nervous control.	Voluntary Movement. Collaborate, Compare, Determine, Explain, Identify, and Interpret.	Dissection L.1.1 Post-test Questions: Anatomy of the Nervous System	
Cardiovascular and Respiratory Systems What is the function and purpose of the cardiovascular system? How does the mammalian cardiovascular system work together with the respiratory system? How do the parts of the mammalian respiratory tract work together to perform respiration?	Explain the purpose and function of the cardiovascular system. Compare the connection between the cardiovascular system and the respiratory system. Explain the purpose and function of the respiratory system. Identify the anatomy of the respiratory system.	Alveoli, Arteries, Arterioles, Blood Pressure, Bronchi, Bronchioles, Capillaries, CBC, Dirofilaria Immitis, Erythrocyte, Hypertension, Hyperpnoea, Hypotension, Hypoxia, Leukocyte, Plasma, Transfusion, Respiration, Veins, Valve, and Venules. Collaborate, Determine, Explain, Identify, and Interpret.	M.1.1 Evaluation Rubric: Heart Dissection Lab M.2.2 Post-test: Identification and Analysis of Blood N.1.1 Evaluation Rubric: Build a Lung Project N.1.1 Post-test Questions: Respiratory Physiology N.2.1 Post-test Questions: Respiratory Anatomy	5 - 6 Weeks
Digestive System and Nutrition What types of things should one consider when creating a balanced diet for an animal? Why is it important to be knowledgeable about animal digestive systems when raising and caring for animals? How do monogastric animals digest their feed versus ruminants? What are the basic nutrients that	Explain the purpose and function of the digestive system and identify the anatomy of its parts. Define the terms digestion, absorption, and metabolism and describe the processes. Differentiate between digestive systems from species to species. Discuss common diseases and disorders that can be caused by improper nutrition. Describe the functions of nutrients, apply them to meet the specific feeding requirements of	AAFCO, Abomasum, Amino Acids, Balanced Ration, BCS, Ceca, Cecum, Concentrates, Crude, Cud, Disaccharides, Dry Matter, Energy, Fat, Forages, Guaranteed Analysis, Lipids, Macro -, Micro -, Monogastric, Nutrient, Omasum, Palatable, Polysaccharides, Portion, Protein, Ration, Regurgitation, Reticulum, Roughages, Rumen, Ruminant, TMR, and Vitamins. Collaborate, Determine, Explain, Identify, and Interpret.	Post-test Questions: Comparative Digestive Anatomy Evaluation Rubric: Amusement Park brochures O.2.2 Post-test Questions: Monogastric Digestive System O.2.4 Post-test Questions: Ruminant Digestive System O.3.1 Evaluation Rubric: Basic Nutrients Lab	5 - 6 Weeks

the body needs to survive?	animals. Recognize that numerous diseases and disorders can be caused by improper nutrition.		O.3.3 Evaluation Rubric: Ration Composition Project	
Animal Reproduction and Genetics	Explain the purpose and function of the reproductive system.	Adenine, Agouti, Allele, Anaphase, Artificial Selection, Backcrossing, Chiasma, Chromatin, Chromosome, Close Breeding, Codominance, Codon, Continuous Breeding, Cross Breeding, Crossing Over, Cytosine, Dam, Dihybrid Cross, Diploid, Directional Selection, Disruptive Selection, Dominate, Genetics, Gestation, Heritability, Natural Selection, Recessive, Qualitative Traits, Quantitative Traits, Sexual Selection, Straight Breeding, Stabilized Selection, Sire, and Variation.	Q.1.1 Post-test Questions: Anatomy of Male Reproductive Tract Q.1.2 Post-test Questions: Anatomy of Female Reproductive Evaluation Rubric: Comparing Reproductive Anatomy Evaluation Rubric: Reproductive Poster QQ.3.1 Evaluation Rubric: Cell Analogy Project QQ.4.2 Post-test Questions: Probability and Punnett QQ.5.1 Post-test Questions: Animal Breeding Systems QQ.5.4 Evaluation Rubric: Artificial Selection Project	5-6 weeks
What reproductive management methods are utilized in animal production?	Identify the anatomy of both the male and female reproductive systems.			
How do cells and their organelles function to maintain animal life?	Interpret the management of the reproductive system, including applications of biotechnology.			
How do cells reproduce asexually? Sexually?	Identify the parts and functions of a cell and how cells reproduce.			
How are genes passed on from parent to offspring?	Describe how traits are passed on genetically from parent to offspring and utilize tools to calculate the probability of traits being passed on.			
How do you use animal breeding systems to achieve hybrid vigor and maximize the potential of producing offspring?	Identify and select animal breeding systems for certain situations and use tools to select the best animal for a situation.	Collaborate, Determine, Explain, Identify, and Interpret.		
Body Systems Examination and Procedures	Determine and implement appropriate therapies.	Asepsis, Debridement, De-gloving, Dehiscence, Edema, Exudates, Granulation Tissue, Lavage, Signalment, Subjective, Tarter, and Virulent.	W.1.1 Evaluation Rubric: Preparation of Operative Site W.2.2 Evaluation Rubric: Bandage Removal W.3.2 Post-test Questions:	4 Weeks
What processes of healing occurred in order for the wound on the skinned knee to heal?	Compare and contrast appropriate treatment methods. Develop an understanding and appreciation for	Collaborate, Develop,		

Why is logical and accurate recordkeeping critical in veterinary medicine?	the skills involved in this process of physical examination as part of the provision of veterinary care.	Determine, Explain, Identify, and Interpret.	Sutures	
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References (APA Format):

Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards. (2015). Retrieved from <https://thecouncil.ffa.org/afnr/>

Curriculum for Agricultural Science and Education. (2021). Retrieved from <https://www.case4learning.org/>