
Pre-Veterinary Science

Curriculum Map

School Year: 2023-2024

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 career.

Course Outline:

Title or Topics / Essential Questions	Content Skills (Activities to cover Essential Questions)	Major Assessments	Vocabulary	Time Frame
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Personal Safety & Animal Handling	<ul style="list-style-type: none"> • Identify the types of hazards common in the veterinary hospital and the organization that regulates safety standards in the workplace. • Review an MSDS and locate important safety information within it. • Determine how to protect one's self from potential hazards in the workplace. • Describe the correct methods of protection given scenarios describing hazardous situations. • Research zoonotic diseases. • Investigate the differences between sanitation, disinfection, and Sterilization. 	<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>A.2.3 Evaluation Rubric: Performing a Surgical Scrub</p> <p>A.2.4 Evaluation: Safety Data Sheets</p> <p>A.2.4 Post-test Questions: Safety Data Sheets</p> <p>A.2.5 Evaluation Rubric: Hazard Mapping</p> <p>A.2.5 Post-test: Hazard Analysis</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>3 - 4 Weeks</p>
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<p>Animals Role in Society</p> <ul style="list-style-type: none"> • How do animals play a role(s) in society? • Are animals capable of fear? • What is a flight zone? • Who is Dr. Temple Grandin? • How did Temple Grandin positivity impact production agriculture? • How is Fear Free practiced in production agriculture? • How is Fear Free practiced in veterinary practices? 	<ul style="list-style-type: none"> • Create a visual presentation and explain an animal's role in society. • List and explain at least ten ways in which animals are used in society. • Discuss the term anthropomorphic and the impacts of anthropomorphism on society's perceptions of animals. • Discuss the impact Dr. Temple Grandin has had on how animals are handled in our society. • Working with a group, design an animal chute to move an animal from cage to cage with minimal stress. 	<p>B.1.1 Evaluation Rubric: A Day in the Life of . . .</p> <p>B.1.1 Post-test Animal Uses in Society</p> <p>B.2.1 Case Study: Dr. Temple Grandin</p> <p>B.2.1 Evaluation Rubric: Reduced Fear Handling Group Project</p> <p>Post-test: Dr. Temple Grandin</p>	<p>Animal Rights Philosophy, Animal Welfare Philosophy, Anthropomorphize, ASPCA, Autism, AWI, Domestication, Endangered Species, Exotic Species, Flight Zone, HSUS, NAIA, PETA, Production Agriculture, and Temple Grandin</p> <p>Collaborate, Compare, Determine, Explain, Identify, and Interpret.</p>	<p>3-4 weeks</p>
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Microbiology <ul style="list-style-type: none"> • What is microbiology? • How would a microscope be used as a diagnostic tool in a veterinary hospital? • What characterizes an organism to be living? • How have microbes contributed to the evolution of the food chain niches that these animals inhabit? 	<ul style="list-style-type: none"> • Define Microbiology. • Identify types of microbes through diagnostic tools. • Apply the shift in relationship from symbiotic to opportunistic. • Explain how pathogens may contaminate food and water sources and create public safety concerns. • Utilize the microbiology principles to prevent the spread of disease. 	F.1.1 Post-test: What Is Microbiology? F.1.2 Evaluation Rubric: Microscope Use F.1.2 Post-test: Using an Oil Immersion Microscope F.2.1 Evaluation Rubric: Creating a Gram-Stained Slide F.2.1 Post-test: Microbe Identification F.3.1 Post-test Questions: Microbial Relationships	Aerobic, Asexual Reproduction, Asymptomatic, Bacteriology, Binomial Nomenclature, Budding, Cellulose, Chlorophyll, Chloroplast, Cilia, Coliform Bacteria, Commensalism, DNA, E. Coli, Eukaryote, Fermentation, Flora, Gross Evaluation, Host, Microbiology, Microbiologist, Morphology, Mutualism, Parasitism, Prokaryote, RNA, Salmonella, Symbiosis, and Taxonomy.	4 - 5 Weeks
Biosecurity <ul style="list-style-type: none"> • How does an “outbreak” occur? • What type of diseases can be spread from animals to humans? 	<ul style="list-style-type: none"> • Identify and differentiate between disease-causing organisms. • Recognize zoonotic diseases. • Assess and predict risks associated with zoonotic diseases. 	G 1.1 Case Studies: Animal Disease G.1.1 Post-test: Common Signs & Symptoms Disease G.1.2. Evaluation Rubric: Disease Transmission } Post-test: Zoonotic Diseases	Antimicrobial, APHIS, Biosecurity, CAFO, Carrier, Cross-Protection, Diagnosis, Diffusely, Endemic, Euthanasia, Fomite, GDP, GNI, HACCP, Husbandry, Indemnity, Infectious	4 – 5 Weeks

<ul style="list-style-type: none"> Why is it important to take an antibiotic as prescribed? How might biosecurity differ for two types of animal production systems? 	<ul style="list-style-type: none"> Compare and contrast healthy and sick animals. Extrapolate reasoning improper use of antibiotics can lead to resistance. Assess risks related to biosecurity and public safety. 	<p>Post-test: Sick Versus Healthy Animals</p> <p>G.2.2. Evaluation Rubric: Antibiotic Resistance</p>	<p>Disease, Mitigation, Morbidity, Morality, Necropsy, NGO, Prevalence, Prevention, Proactive, prognosis, Quarantine, Reservoir, USDA, Vector, and Zoonotic.</p>	
<p>Skeletal, Muscular, and Nervous Systems</p> <ul style="list-style-type: none"> Do different bones serve different purposes in the body? How would movement be different without joints, ligaments and tendons? How do bones and muscle work together to allow movement? How does the nervous system interact with other body systems? 	<ul style="list-style-type: none"> Identify of bones, bone structure and bone location is essential to develop a total understanding of the skeletal system and general body supporting structure. Determine how joints, ligaments and tendons allow the bone components of a skeletal system to work together for body movement and support. Recognize the anatomy and types of muscle. Describe how the nervous system interacts with all other body systems for both voluntary motor function and involuntary autonomic nervous control. 	<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 Dissection</p> <p>L.1.1 Post-test Questions: Anatomy of the Nervous System</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 Voluntary Movement.</p> <p>Collaborate, Compare, Determine, Explain, Identify, and Interpret.</p>	<p>5 - 6 Weeks</p>

<p>Cardiovascular and Respiratory Systems</p> <ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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. 	<p>M.1.1 Evaluation Rubric: Heart Dissection Lab</p> <p>M.2.2 Post-test: Identification and Analysis of Blood</p> <p>N.1.1 Evaluation Rubric: Build a Lung Project</p> <p>N.1.1 Post-test Questions: Respiratory Physiology</p> <p>N.2.1 Post-test Questions: Respiratory Anatomy</p>	<p>Alveoli, Arteries, Arterioles, Blood Pressure, Bronchi, Bronchioles, Capillaries, CBC, Dirofilaria Immitis, Erythrocyte, Hypertension, Hyperpnoea, Hypotension, Hypoxia, Leukocyte, Plasma, Transfusion, Respiration, Veins, Valve, and Venules.</p> <p>Collaborate, Determine, Explain, Identify, and Interpret.</p>	<p>3-4 Weeks</p>
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<p>Digestive System and Nutrition</p> <ul style="list-style-type: none"> • 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 the body needs to survive? 	<ul style="list-style-type: none"> • 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 animals. • Recognize that numerous diseases and disorders can be caused by improper nutrition. 	<p>O.2.0 Post-test Questions: Comparative Digestive Anatomy O.2.1 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 O.3.3 Evaluation Rubric: Ration Composition Project</p>	<p>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.</p> <p>Collaborate, Determine, Explain, Identify, and Interpret.</p>	<p>3-4 Weeks</p>
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Animal Reproduction and Genetics	<ul style="list-style-type: none"> • What reproductive management methods are utilized in animal production? • How do cells and their organelles function to maintain animal life? • How do cells reproduce asexually? Sexually? • How are genes passed on from parent to offspring? • How do you use animal breeding systems to achieve hybrid vigor and maximize the potential of producing offspring? 	<ul style="list-style-type: none"> • Explain the purpose and function of the reproductive system. • Identify the anatomy of both the male and female reproductive systems. • Interpret the management of the reproductive system, including applications of biotechnology. • Identify the parts and functions of a cell and how cells reproduce. • Describe how traits are passed on genetically from parent to offspring and utilize tools to calculate the probability of traits being passed on. • Identify and select animal breeding systems for certain situations and use tools to select the best animal for a situation. 	<p>Q.1.1 Post-test Questions: Anatomy of Male Reproductive Tract</p> <p>Q.1.2 Post-test Questions: Anatomy of Female Reproductive</p> <p>Q.2.1 Evaluation Rubric: Comparing Reproductive Anatomy</p> <p>Q.2.2 Evaluation Rubric: Reproductive Poster</p> <p>QQ.3.1 Evaluation Rubric: Cell Analogy Project</p> <p>QQ.4.2 Post-test Questions: Probability and Punnett</p> <p>QQ.5.1 Post-test Questions: Animal Breeding Systems</p> <p>QQ.5.4 Evaluation Rubric: Artificial Selection Project</p>	<p>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.</p> <p>Collaborate, Determine, Explain, Identify, and Interpret.</p>	3-4 weeks
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Body Systems Examination and Procedures <ul style="list-style-type: none"> What processes of healing occurred in order for the wound on the skinned knee to heal? Why is logical and accurate recordkeeping critical in veterinary medicine? 	<ul style="list-style-type: none"> Determine and implement appropriate therapies. Compare and contrast appropriate treatment methods. Develop an understanding and appreciation for the skills involved in this process of physical examination as part of the provision of veterinary care. 	W.1.1 Evaluation Rubric: Preparation of Operative Site W.2.2 Evaluation Rubric: Bandage Removal W.3.2 Post-test Questions: Sutures	Asepsis, Debridement, De-gloving, Dehiscence, Edema, Exudates, Granulation Tissue, Lavage, Signalment, Subjective, Tarter, and Virulent. Collaborate, Develop, Determine, Explain, Identify, and Interpret.	3-4 weeks
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Standards:

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. (2023). Retrieved from <https://www.case4learning.org/>