			Veterinary Science Grade 12 **Unit #1**
Course/Subject: Veterinary Science/ Agriculture	**Grade:** 12	**Comparative Anatomy and Physiology**	**Suggested Timeline:** 22 Weeks

Grade Level Summary	Students will use knowledge and skills in veterinary terminology, cellular biology and tissue biology to study the anatomy and physiology of the cardiovascular, musculoskeletal, and respiratory systems in common agricultural and companion animals. Students will intensely study comparative anatomy and physiology of the digestive, reproductive, endocrine and neurological systems through lab exercises and projects. Modern biotechnology and genetics will be studied to assess how procedures such as artificial insemination and embryo transplant can lead to increased production efficiency.
Grade Level Units	**Unit 1: Comparative Anatomy and Physiology** Unit 2: Nutrition Unit 3: Diseases Unit 4: Clinical Procedures

Unit Title	Comparative Anatomy and Physiology
Unit Summary	The largest unit in Veterinary Science teaches students about the anatomy and physiology of large animals and companion animals. Students will gain knowledge about tissue types, musculoskeletal system, circulatory system, respiratory system, renal system, digestive system, reproductive system, nervous system, endocrine system, the immune system.

Unit Essential Questions:

1. How does the most basic form of life survive?
2. What is the function of body tissue?
3. How does the musculoskeletal system support and move a body?
4. What is the function of the circulatory system?
5. What is the function of the respiratory system?
6. How does the renal system function?
7. What are the similarities and differences of digestive systems?
8. How does the reproductive system work in different species and genders?
9. What is the function of the nervous system?
10. What is the function of the endocrine system?
11. What is the function of the immune system?

Key Understandings:

1. Basic Cell Biology
2. Tissue Types and Functions
3. Musculoskeletal System
4. Circulatory System
5. Respiratory System
6. Renal System
7. Digestive System
8. Reproductive System
9. Nervous System
10. Endocrine System
11. Immune System

Focus Standards Addressed in the Unit:	
Standard Number	*Standard Description*
AS.06.03.01.a.	Identify and summarize how an animal's health can be affected by anatomical and physiological disorders.
AS.06.03.01.b.	Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.
AS.06.02.	Apply principles of comparative anatomy and physiology to uses within various animal systems.
AS.06.01.	Classify animals according to taxonomic classification systems and use (e.g. agricultural, companion, etc.).

Important Standards Addressed in the Unit:	

Misconceptions:	**Proper Conceptions:**
1. All organs function the same in different animals.	1. In each species, organs can function differently for those animals making unique features.

Knowledge & Concepts	Skills & Competencies	Dispositions & Practices
● Explain the molecular makeup of cells ● Basic function of the cell ● Mitosis and its clinical significance in diseases ● Describe the properties, locations, functions, and varieties of epithelial tissue ● Describe the properties, locations, functions, and varieties of connective tissue ● Describe the properties, locations, functions, and varieties of muscle tissue ● Describe the properties, locations, functions, and varieties of nerve tissue ● Describe the functions of the musculoskeletal system ● Detail the structure of bone ● Name joint types and their role in movement ● Explain how bone grows and remodels ● Explain function of blood ● Discuss the function of breathing ● Understand urine and blood as a measure of health ● Explain digestion in monogastrics ● Steps to establish pregnancy ● Describe the neuron, the nerve impulse, and the synapse	● Identify the basic structures of the cell and their corresponding functions ● Detail meiosis in mammalian reproduction ● Connect cellular parts and function to clinical veterinary practice ● Link knowledge of tissues to clinical practice ● Relate bone and muscle groups to movement ● Identify structures within a mammalian heart ● Trace the flow of blood through the heart and body while detailing the parts of blood vessels and their structural significance ● Identify the basic components of the respiratory tract ● Identify the basic structures in the renal system ● Explain the functions of the renal system ● Identify the basic structure of the digestive system ● Compare and contrast the specialization of dentition and digestive tracts found in the various domestic species ● Identify male and female anatomy and how it relates to associated hormonal function	● Curiosity ● Learning to learn

• Discuss the anatomy and function of the spinal cord • Describe the endocrine system	• Identify the stages of parturition • Identify the major structures of the brain and name associated functions • Compare and contrast the function of the sensory somatic system to the autonomic nervous system and differentiate between the two branches of the autonomic system • Explain the significance of immunity • Distinguish between passive and active immunity	

Academic Vocabulary:

• Anesthetize • Antibiotics • Cancer • Lipid • Glucose • Diabetes • Glycogen • Enzymes • Antibodies • Exocytosis • Metabolism • Anabolism • Catabolism • Homeostasis • Diffusion • Osmosis • Active transport • Endocytosis • Benign • Malignant • Pathologists • Ventral • Serum • Gout • Mastitis • Intravenous • Isotonic • Urinalysis • Specific gravity • Refractometer • Free catch urine • Azotemia • Parvovirus • Uremia • Acute • Chronic • Subcutaneous • Skin turgor • Intussusception • Colic • Carnivore • Herbivore • Deciduous teeth • Peristalsis	• Tissue • Organs • Displaced abomasums • Foot and mouth disease • Epithelial tissues • Integument • Keratin • Tendons • Ligaments • Adipose Tissue • Myofiber • Porcine Stress Syndrome • Rigor Mortis • Hypocalcemia • Sweeny • Central Nervous System • Peripheral nervous system • Neurons • Tying Up • Horner’s Syndrome • Herd Check • Respiration • Palpated • Endotracheal Tube • Inspiration • Expiration • Cyanosis • Pneumonia • Pleural Fraction Rub • Contagious • Roaring • Heaves • Bronchodilators • Bucks • Does • Dorsal • Retro • Urinary incontinence • Spayed • Ovariohysterectomy • Castration • Prolapsed uterus • Epidural • Lidocaine	• Radiograph • Orthopedic Surgeon • Axial Skeleton • Appendicular Skeleton • Intervertebral disk disease • High Rise Syndrome • Cranial Drawer Sign • Ossification • Subluxate • X-ray • Radiology • Simple Fracture • Compound Fracture • Intramedullary Pin • Hip Dysplasia • Degenerative joint Disease • Joint Ill • Hardware Disease • Centrifuge • Erythropoiesis • Cranial • Caudal • Arteries • Veins • Pacemaker System • Cardiac Cycle • Systole • Diastole • Electrocardiograph • Electrocardiogram • Arrhythmia • Tachycardia • Cardiopulmonary resuscitation • Heart Murmur • Hypoemia • Hyeremia • Autoimmune disease • Shock • Heart Failure • Circling disease • Listeriosis • Epilepsy • Cervical disk disease

- Monogastric
- Phenobarbital
- Symbiosis
- Rumination
- Eructate
- Retching
- Vestibular system
- Bloat
- Diabetes insipidus
- Diabetes mellitus
- Hypoglycemia
- Shunting
- Rickets
- Alopecia
- Cushing's disease
- Iatrogenic
- Abscess
- Banded
- Tetanus
- Antigen
- Lymph
- Stocking Up
- Phagocytized
- Anaphylaxis
- Estrous cycle
- Puberty
- Estrus
- Polyestrus
- Seasonal polyestrus
- Anestrus
- Pheromone
- Parturition
- Gestation
- Weaned
- Obstetric
- Whelping
- Cesarean section
- Ligated
- Pyometra
- Cryptorchidism
- Edema
- Humoral immunity
- Primary response
- Secondary response
- Pus
- Modified live vaccines
- Killed vaccines
- Titer
- Equine protozoal myeloencephalitis
- Neuron
- Volt
- Polarization
- Myelinated nerves
- Coma
- Myelogram
- Sensory somatic system
- Autonomic system
- Plexus
- Sympathetic system
- Dilate
- Constrict
- Nystagmus
- Ataxia
- Atrophy
- Addison's Disease
- Active Immunity
- Passive Immunity
- Colostrums
- Intranasally
- Kennel cough
- Pruritus
- Atopy
- Seroconversion

Assessments:

- Quizzes
- Test
- Projects
- Class participation and practices

Differentiation:

- Book work
- Lecture
- Demonstrations
- Video clips
- Hands on learning
- IEP accommodations

Interdisciplinary Connections:

- Science
- Math

Additional Resources:

- *Introduction to Veterinary Science* by James Lawhead and Meecee Baker
- Power Points
- Cornell Veterinary Science Manual

Created By:
Meagan Smyers

			Veterinary Science Grade 12 **Unit #2**
Course/Subject: Veterinary Science/ Agriculture	**Grade:** 12	**Nutrition**	**Suggested Timeline:** 4 Weeks

Grade Level Summary	Students will use knowledge and skills in veterinary terminology, cellular biology and tissue biology to study the anatomy and physiology of the cardiovascular, musculoskeletal, and respiratory systems in common agricultural and companion animals. Students will intensely study comparative anatomy and physiology of the digestive, reproductive, endocrine and neurological systems through lab exercises and projects. Modern biotechnology and genetics will be studied to assess how procedures such as artificial insemination and embryo transplant can lead to increased production efficiency.
Grade Level Units	Unit 1: Comparative Anatomy and Physiology **Unit 2: Nutrition** Unit 3: Diseases Unit 4: Clinical Procedures

Unit Title	Nutrition
Unit Summary	During this unit, students will learn about the basic nutrient requirements for animals. Students will gain an understanding of nutrition requirements for numerous species of livestock and companion animals. Students will learn to read feed labels, formulate feed rations, and make feeding decisions. Students will also learn about species specific specialized digestive systems.

Unit Essential Questions:	**Key Understandings:**
1. What are the basic nutrient requirements? 2. How do I choose feedstuffs suitable for maximum energy for my animal?	1. Basic Nutrients 2. Species comparison 3. Pet Food Labels 4. Equine Nutrition 5. Ruminant Nutrition

Focus Standards Addressed in the Unit:	
Standard Number	*Standard Description*
AS.03.01.	Analyze the nutritional needs of animals.
AS.03.02	Analyze feed rations and assess if they meet the nutritional needs of animals.
AS.03.03	Utilize industry tools to make animal nutrition decisions.

Important Standards Addressed in the Unit:	

Misconceptions:	Proper Conceptions:
1. Dry feedstuffs do not have expiration dates.	1. Even dry feed expires. Feeding expired food can cause illness or death to your animal.

Knowledge & Concepts	Skills & Competencies	Dispositions & Practices
● Know the 6 major components of animal diets and their significance to nutrition ● Explain the general principles in animal nutrition ● Discuss the horse's ability to digest fiber and the role in equine nutrition ● Detail the ruminant's ability to digest fiber and its role in ruminant nutrition.	● Formulate a feed ration ● Describe the important features found on pet food labels and compare and contrast the nutritional requirements for dogs and cats	● Responsibility ● Learning to Learn

Academic Vocabulary:

● Autopsy	● Hydrolysis	● Free choice diet
● Postmortem	● Rodenticide	● Resting energy rate
● Constipation	● Free radicals	● Maintenance energy requirement
● Flatulence	● Dry matter	● Grazing
● Calorie	● Hemolysis	● Concentrates
● Forages	● Cribbing	● Float
● Bolt	● Eructation	● Total mixed ration

Assessments:

- Quizzes
- Test
- Projects
- Class participation and practices

Differentiation:

- Book work
- Lecture
- Demonstrations
- Video clips
- Hands on learning
- IEP accommodations

Interdisciplinary Connections:

- Math
- Science

Additional Resources:

- *Introduction to Veterinary Science* by James Lawhead and Meecee Baker
- Power Points
- Cornell Veterinary Science Manual

Created By:
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			Veterinary Science Grade 12 **Unit #3**
Course/Subject: Veterinary Science/ Agriculture	**Grade:** 12	**Diseases**	**Suggested Timeline:** 5 Weeks

Grade Level Summary	Students will use knowledge and skills in veterinary terminology, cellular biology and tissue biology to study the anatomy and physiology of the cardiovascular, musculoskeletal, and respiratory systems in common agricultural and companion animals. Students will intensely study comparative anatomy and physiology of the digestive, reproductive, endocrine and neurological systems through lab exercises and projects. Modern biotechnology and genetics will be studied to assess how procedures such as artificial insemination and embryo transplant can lead to increased production efficiency.
Grade Level Units	Unit 1: Comparative Anatomy and Physiology Unit 2: Nutrition **Unit 3: Diseases** Unit 4: Clinical Procedures

Unit Title	Diseases
Unit Summary	In this unit, students will learn about infectious diseases that infect our domesticated animals. Students will learn how to create plans for disease prevention and be able to educate others about disease prevention. Students will learn how diseases are classified and which of those diseases are contagious to humans. Students will learn the processes that are used to diagnose diseases in companion animals and livestock.

Unit Essential Questions:	**Key Understandings:**
1. What are the four major classes of infectious disease causing agents? 2. What is considered in a good disease prevention plan? 3. Why is it necessary to classify diseases? 4. How can zoonoses be harmful to humans? 5. How does a patient history help to diagnosis disease?	1. Infectious Disease 2. Disease Prevention 3. Classification of Diseases 4. Zoonoses 5. Diagnosis of Disease

Focus Standards Addressed in the Unit:

Standard Number	*Standard Description*
AS.07.01.	Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.
AS.07.02.	Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national, and global level.

Important Standards Addressed in the Unit:

Misconceptions:	Proper Conceptions:
1. History of an animal does not matter when diagnosing a disease.	1. All history should be given, even if it is only that the owner tried a home remedy prior to consultation.

Knowledge & Concepts	Skills & Competencies	Dispositions & Practices
● Describe Koch's Postulates ● List important distinguishing features and give examples of major disease agents and discuss the resulting diseases ● Name the basic components of disease prevention ● Classify diseases, match them with the domestic species in which they occur, and discuss their clinical significance ● List the major methods used to diagnose disease and cite examples of disease diagnosis with each testing method.	● Describe the types of vaccines available and their roles in disease prevention. ● Describe several disease common in domestic animals that are contagious to humans ● Discuss the clinical significance of disease diagnosis	● Curiosity ● Learning to Learn

Academic Vocabulary:

● Coliform	● Antioxidant	● Metastasis
● Botulism	● Ventilation	● Rabies
● Anthrax	● Tunnel ventilation	● Visceral larva migrans
● Koch's postulates	● Wet dewlap	● Cutaneous larva migrans
● Fomite	● Biosecurity	● Toxoplasmosis
● Vector	● Equine infectious anemia	● Cat scratch fever
● Eukaryotic	● Quarantine	● Ring worm
● Prokaryotic	● Fibrosarcoma	● RNA viruses
● Prodromal phase	● Schistosomus reflexus	● Q fever
● Anemia	● Congenital	● Pasteurization
● Systemic	● Hemophilia	● Mad cow disease
● Lyme Disease	● Arthritis	● Scrapie
● Antimicrobial	● Pneumothorax	● West nile fever
● Bacteriostatic	● Peritonitis	● Brucellosis
● Antiseptics	● Idiopathic	● Tuberculosis
● Disinfectants	● Neoplasm	● Signalment
● Complete blood cell count (CBC)	● Packed Cell Volume	● Borborygmi
● Serology	● Chemistry Panel	● Ophthalmoscope

Assessments:

- Quizzes
- Test
- Projects
- Class participation and practices

Differentiation:

- Book work
- Lecture
- Demonstrations
- Video clips
- Hands on learning
- IEP accommodations

Interdisciplinary Connections:

- Science

Additional Resources:

- *Introduction to Veterinary Science* by James Lawhead and Meecee Baker
- Power Points
- Cornell Veterinary Science Manual

Created By:

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			Veterinary Science Grade 12 **Unit #4**
Course/Subject: Veterinary Science/ Agriculture	**Grade:** 12	**Clinical Procedures**	**Suggested Timeline:** 5 weeks

Grade Level Summary	Students will use knowledge and skills in veterinary terminology, cellular biology and tissue biology to study the anatomy and physiology of the cardiovascular, musculoskeletal, and respiratory systems in common agricultural and companion animals. Students will intensely study comparative anatomy and physiology of the digestive, reproductive, endocrine and neurological systems through lab exercises and projects. Modern biotechnology and genetics will be studied to assess how procedures such as artificial insemination and embryo transplant can lead to increased production efficiency.
Grade Level Units	Unit 1: Comparative Anatomy and Physiology Unit 2: Nutrition Unit 3: Diseases **Unit 4: Clinical Procedures**

Unit Title	Clinical Procedures
Unit Summary	During this unit, students will develop a wide skill set that can be utilized in a veterinary practice. Students will gain hands on practice to use in jobs, internships, and FFA competitions. Students will learn a variety of skills necessary for entry level work at a veterinary clinic.

Unit Essential Questions:	**Key Understandings:**
1. How do you keep an animal safe during procedures? 2. How do you maintain a clean and safe facility?	1. Surgery 2. Restraints 3. Injections 4. Clinical Procedures

Focus Standards Addressed in the Unit:

Standard Number	*Standard Description*
AS.07.01.01.c.	Select and use tools and technology to meet specific animal health management goals
CS.05.01.02.b.	Analyze personal skill-set and create a plan for obtaining the required education, training, and experiences to obtain a career in an AFNR pathway
CS.05.02.01.b.	Assess personal skills and align them with potential career opportunities in AFNR pathways

Important Standards Addressed in the Unit:

Misconceptions:	**Proper Conceptions:**
1. You must be a licensed vet tech to work at a veterinarian's office in Pennsylvania.	1. Pennsylvania does not require you to have a licensed vet tech to do basic procedures in the office.

Knowledge & Concepts	Skills & Competencies	Dispositions & Practices
• Explain the clinical significance of the basic principles of successful surgery • Explain the clinical significance of healing of lacerations by first and second intention • Explain the clinical significance of common considerations in veterinary surgeries	• Restraint techniques • Administering oral tablets • Administering aural medication • Administering ophthalmic medication • Administering intramuscular injection • Administering subcutaneous injection • Bandage removal • Filling syringes • Fecal floatation • Preparing a surgical pack • Opening a sterile surgical pack • Surgical site prep • Prescription filling • Removal of sutures • Placing a tail tie	• Curiosity • Responsibility

Academic Vocabulary:

• Aseptic technique • Disinfectants • Sterilization • Autoclave • Antiseptic • Dehiscence	• Granulation tissue • First intention healing • Golden period • Second intention healing • Intestinal anastomosis • Necrotic	• Proud flesh • Debridement • Hematoma • Seroma • Abscess • Gastric dilationvolvulus syndrome

Assessments:

- Quizzes
- Test
- Projects
- Class participation and practices

Differentiation:

- Book work
- Lecture
- Demonstrations
- Video clips
- Hands on learning
- IEP accommodations

Interdisciplinary Connections:

- Math
- Science

Additional Resources:

- *Introduction to Veterinary Science* by James Lawhead and Meecee Baker
- Power Points
- Cornell Veterinary Science Manual
- National FFA Veterinary Science CDE Manual

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