

# Veterinary Science II

**8089 36 weeks / 140 hours**

## Table of Contents

Acknowledgments.....	1
Course Description.....	2
Task Essentials Table.....	3
Curriculum Framework.....	6
SOL Correlation by Task.....	48
FFA Information.....	52
Teacher Resources.....	52
Appendix: Credentials, Course Sequences, and Career Cluster Information.....	54

## Acknowledgments

The components of this instructional framework were developed by the following curriculum development team members:

Karen Bowles, Veterinary Science Instructor and Licensed Veterinary Technician, Advanced Career Education Center at Hermitage  
Laurie Damron, Instructor and Certified Veterinary Assistant, Massanutten Technical Center  
Laura Delano, Instructor and Certified Veterinary Assistant, Culpeper County High School  
Dr. Carmen Franck Vaughn, DVM, Veterinarian, Carmen Franck Vaughn, DVM PLLC  
Dr. Carter Hounsel, DVM, Supervisory Veterinary Medical Officer and Emergency Coordinator, USDA Animal and Plant Health Inspection Service: Veterinary Services  
Anne Hudson, Instructor and Licensed Veterinary Technician, College and Career Academy at Pruden  
Karen Nestlerode, Veterinary Science Instructor, Edison Academy  
Katie Reames, Director of Feed and Nutrition Services, CFC Farm and Home Center  
Debra Rosson, Veterinary Science Instructor and Licensed Veterinary Technician, New Horizons Career and Technical Center  
Kathryn Simunich, Instructor and Certified Pet Groomer, Louisa County High School  
Theresa Thompson, Instructor and Certified Veterinary Assistant, Stuarts Draft High School  
Valerie Webb, Agriculture Instructor, Spotsylvania High School  
Amanda Wooden, Animal Import Coordinator, Virginia Department of Agriculture and Consumer Services

Correlations to the Virginia Standards of Learning were reviewed and completed by:

Vickie L. Inge, Mathematics Committee Member, Virginia Mathematics and Science Coalition  
Anne F. Markwith, New Teacher Mentor, Gloucester County Public Schools  
Cathy Nichols-Cocke, PhD, Fairfax High School, Fairfax County Public Schools  
Caroline C. Wheeler, M.T., Secondary English, Richmond

The framework was edited and produced by the CTE Resource Center:

Robin A. Jedlicka, Writer/Editor  
Kevin P. Reilly, Administrative Coordinator

LaVeta M. Nutter, Specialist, Agricultural Education and Related Clusters  
Office of Career, Technical, and Adult Education  
Virginia Department of Education

Dr. Tricia S. Jacobs, CTE Coordinator of Curriculum and Instruction  
Office of Career, Technical, and Adult Education  
Virginia Department of Education

---

Copyright © 2017

## Course Description

**Suggested Grade Level:** 11 or 12

**Prerequisite:** 8088

Students expand their knowledge of animal science and the care of animals, including animal structure and function, microbes and disease prevention, parasitology, and genetics and breeding. Students develop more advanced skills and techniques for assisting the veterinarian/technician in the following areas: performing first aid and surgery, applying aseptic techniques, performing technical functions, administering medication, handling death and dying, working with wildlife, and performing office functions. On-the-job clinical instruction coordinated by the instructor may be included in veterinary offices or animal clinics.

*NOTE: This course has specific state laws and regulations from a governing medical board or agency. Please contact the Virginia Department of Education, Office of Career and Technical Education prior to implementing this course. All inquiries may be sent to [cte@doe.virginia.gov](mailto:cte@doe.virginia.gov).*

*As noted in [Superintendent's Memo #058-17 \(2-28-2017\)](#), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.*

# Task Essentials Table

8089	Tasks/Competencies
+	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.
+	Participate in an SAE.
+	Identify the benefits and responsibilities of FFA membership.
+	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.
○	Apply for an FFA degree and/or an agricultural proficiency award.
○	Explain husbandry of exotic animals.
○	Describe how to lift and carry exotic animals.
○	Describe methods of moving nonaggressive exotic animals into and out of cages/enclosures.
○	Describe nutritional needs of and feeding procedures for exotic animals.
○	Describe restraint procedures to facilitate veterinary examination of exotic animals.
○	Explain how to perform a partial water change and filter change on an aquarium.
+	Explain the importance of performing and reporting all laboratory procedures with complete accuracy.
+	Describe the management of laboratory samples.
+	Explain the procedure for preparing and staining blood films.
+	Describe common abnormalities seen in blood films.
+	Perform a urinalysis.
+	Identify veterinary instruments and equipment and their uses.
+	Describe methods for cleaning, disinfecting, and preparing surgical instruments.
+	Explain bandaging and splinting methods.
+	Identify types of syringes and their uses.
+	Explain methods of dental care for animals.
+	Explore spaying and neutering options.
+	Describe preparation of a patient for surgery.

+	Explain the concept of disease.
+	Describe the characteristics of disease-producing agents.
+	Explain common animal diseases and their treatments.
+	Describe the concept of immunity.
+	Explain basic vaccine concepts.
+	Identify common animal diseases that can be prevented by vaccination.
+	Describe the factors involved in vaccination schedules.
+	Explain concepts of animal quarantine.
+	Describe common diseases and their symptoms in companion animals.
+	Describe treatments and preventive measures for common diseases.
+	Explain concepts of parasitology.
+	Identify parasites that commonly affect animals.
+	Explain the life cycle of parasites and its relationship to parasitic infestation, detection, and treatment.
+	Describe the clinical signs and symptoms of common parasitic infestations.
+	Explain standard diagnostic procedures for determining the presence of parasites.
+	Describe preventive measures and common treatments for parasitic infestation.
+	Explain the concept of pharmacology.
+	Describe local, state, and national organizations that focus on animal protection and health.
+	Describe the categories of commonly used veterinary medications.
+	Describe routes of medication administration.
+	Determine the best method for administering a medication.
+	Describe factors that affect dose determination.
+	Calculate dosages for weight-based medications.
+	Interpret information on medication labels.
+	Explain the importance of avoiding specific drug combinations.

+	Describe administration of oral and topical medications.
+	Describe how to prepare and dispense medications that a client will administer at home.
+	Explain the different levels of control for medications.
+	Complete basic four-function operations with whole numbers, fractions, and decimals.
+	Identify basic units of the commonly used systems of measurement.
+	Perform conversions between common systems of measurement.
+	Measure liquids.
+	Dilute liquids, following label directions.
+	Calculate amounts for dilutions.
+	Solve word problems associated with veterinary medicine.
+	Explain the concept of first aid and its importance to the veterinary assistant's work.
+	Describe the components of a pet first-aid kit and the uses of each.
+	Identify common situations and conditions requiring first aid.
+	Describe how to prioritize common emergencies.
+	Identify local resources for animal care.
+	Explain the relationship between animal welfare and the animal rights movement.
+	Describe ethical standards for veterinary practice.
+	Explain the layout of the veterinary facility and rationale for the design.
+	Maintain working knowledge of current veterinary-specific computer software.
+	Check client in and out.
+	Maintain animal owner identification.
+	Describe how to handle client inquiries about products or services.
+	Identify current and emerging technologies and advances in veterinary science.
+	Explain the concept of biotechnology as related to veterinary science.
+	Explain the relationship among genes, chromosomes, and deoxyribonucleic acid (DNA).
+	Explain the formation of gametes and zygotes and their relationship to inherited traits.

<input checked="" type="radio"/>	Describe the use of genetics in selective breeding.
<input checked="" type="radio"/>	Compare outcrossing/mixed breeding, line breeding, and inbreeding.
<input checked="" type="radio"/>	Describe breeding cycles.
<input checked="" type="radio"/>	Analyze the ethical aspects of breeding.
<input type="radio"/>	Identify wildlife species common to the locale.
<input type="radio"/>	Locate a wildlife rehabilitator for a given species.
<input type="radio"/>	Describe provision of interim care to injured or orphaned wildlife.
<input type="radio"/>	Explain legal issues affecting the care and handling of wildlife.

Legend:  Essential  Non-essential  Omitted

---

**Note: Competencies 39-43 have been added to ensure compliance with federal legislation: National FFA Organization's Federal Charter Amendments Act (Public Law 116-7, <https://www.congress.gov/116/plaws/publ7/PLAW-116publ7.pdf>). All inquiries may be sent to [cte@doe.virginia.gov](mailto:cte@doe.virginia.gov). Students are provided opportunities for leadership, personal growth, and career success. Instruction is delivered through three major components: classroom and laboratory instruction, supervised agricultural experience (SAE) program, and student leadership (FFA).**

---

# Curriculum Framework

## Task Number 39

### Identify the role of supervised agricultural experiences (SAEs) in agricultural education.

#### Definition

Identification should include

- defining an SAE program as *an opportunity for students to consider multiple careers and occupations in the agriculture, food, and natural resources (AFNR) industries, learn expected workplace behavior, develop specific skills within an industry, and apply academic and occupational skills in the workplace or a simulated workplace environment*
- researching the Foundational SAE
  - career exploration and planning
  - personal financial planning and management
  - workplace safety

- employability skills for college and career readiness
- agricultural literacy
- researching the Immersion SAE
  - entrepreneurship/ownership
  - placement/internships
  - research (experimental, analytical, invention)
  - school business enterprises
  - service learning
- developing a plan to participate in an SAE, based on personal and career goals
- researching available awards and degrees, based on SAE participation.

Teacher resource: [SAE Resources](#), National Council for Agricultural Education

## Process/Skill Questions

- What are examples of SAEs related to this course and in the AFNR industries?
- Where can a copy of the Virginia SAE Record Book be found?
- What is an Immersion SAE?
- How does a placement/internship SAE differ from an ownership/entrepreneurship SAE?
- How does an SAE provide relevant work experience and contribute to the development of critical thinking skills?
- How is the SAE an extended individualized instructional component of a student's Career Plan of Study?
- How can an SAE be used to provide evidence of student growth and participation in authentic, work-related tasks?
- What are the four types of SAEs?
- What are the advantages of participating in work-based learning experiences and projects?
- How does one choose an appropriate SAE in which to participate?

## Task Number 40

### Participate in an SAE.

#### Definition

Participation should include

- developing, completing, or continuing a plan to participate in an SAE as a work-based learning experience, based on personal and career goals
- documenting experience, connections, positions held, and competencies attained, using the *Virginia SAE Record Book*
- researching available awards and degrees, based on SAE participation.

Teacher resources:

[FFA SAE](#)

[The Agricultural Experience Tracker](#)

## Process/Skill Questions

- What are the advantages of participating in work-based learning experiences and projects?
- How do SAEs help prepare students for the workforce?
- What are some examples of SAEs in AFNR?

# Exploring Leadership Opportunities through FFA

---

---

## Task Number 41

### Identify the benefits and responsibilities of FFA membership.

#### Definition

Identification should include

- benefits
  - listing opportunities to participate in community improvement projects and career development events (CDEs) and leadership development events (LDEs)
  - exploring leadership development opportunities
- responsibilities
  - researching the responsibilities of FFA officers, committees, and members
  - locating resources that guide participation in FFA activities
  - explaining the FFA Creed, Motto, Salute, and mission statement
  - explaining the meaning of the FFA emblem, colors, and symbols
  - explaining significant events and the history of the organization.

## Process/Skill Questions

- How does one become an FFA member?
- What is the FFA's mission and how does it accomplish its mission?
- What are the benefits and responsibilities of FFA membership?
- What five FFA activities are available through the local chapter?
- What are some significant events in FFA history? How have these events shaped membership over time?
- What is the FFA program of activities (POA), and how is it used?

## Task Number 42

### Describe leadership characteristics and opportunities as they relate to agriculture and FFA.



## Definition

Description should include

- examples of successful leaders
- types of leadership
  - autocratic
  - participative
  - laissez-faire
  - servant
  - followership
- positive leadership qualities and traits of successful leaders
- opportunities for participating in leadership activities in FFA
- demonstrating methods for conducting an effective meeting.

## Process/Skill Questions

- Who are some successful leaders in the agriculture industry?
- What qualities make a successful leader?
- What are leadership traits?
- What is the difference between positive and negative leadership?

## Task Number 43

**Apply for an FFA degree and/or an agricultural proficiency award.**

## Definition

Application should include

- identifying types of FFA degrees
  - Greenhand
  - Chapter
  - State
  - American
- identifying proficiency award areas
  - entrepreneurship
  - placement
  - combined
  - agriscience research
- exploring CDEs and LDEs related to this course
- identifying all SAE criteria to be eligible for the award
- identifying the type of award
- applying for an FFA award.

Teacher resource: [FFA Agricultural Proficiency Awards](#)

## Process/Skill Questions

- Where are the awards and their application criteria located?
- What are the benefits of winning an FFA award?
- What are the benefits and requirements of an FFA degree?
- What FFA awards are available?
- How does the FFA degree program reward FFA members in all phases of leadership, skills, and occupational development?
- What is the highest degree that can be conferred upon an FFA member at the national level?
- What are the requirements for a Greenhand FFA degree?

## Handling Exotic Animals

---



---

### Task Number 44

#### Explain husbandry of exotic animals.

##### Definition

Explanation should include

- identification of exotic animals commonly kept as pets (e.g., rodents, rabbits, reptiles, birds, fish)
- identification of the colorations and other physical characteristics of breeds within a species
- dietary and habitat requirements of each species
- the need for, and methods of, providing environmental enrichment to each species
- natural behaviors of each species that may mask signs of illness
- common health/disease issues and preventive practices for each species (e.g., checking for malocclusion, trimming overgrown nails/beaks, providing dust baths)
- appropriate sanitation methods for housing and equipment used with each species.

##### Process/Skill Questions

- Why is it important to learn about the exotic animals commonly kept as pets?
- What resources are available to study these species and their habitat requirements?
- How could failure to understand habitat requirements contribute to illness in a pet?
- What color variations occur within a species?
- What common diseases affect the species discussed?

### Task Number 45

#### Describe how to lift and carry exotic animals.

##### Definition

Description should include

- industry-standard handling techniques for each species of exotic animal
- differences in handling techniques based on species
- restraint equipment that can be used on each species
- potential health/safety risks to handler when handling each species, and ways to minimize these risks
- possible injuries to each species that may result from improper restraint (e.g., tail trauma, fur slip, respiratory distress).

### **Process/Skill Questions**

- What defense mechanisms employed by various species of reptile could cause injury to the handler?
- Why should turtles not be turned over from side to side (versus end over end) during restraint/handling?
- Why should more than one handler carry large snakes?
- What defense mechanisms employed by the various avian species could cause injury to the handler?

## **Task Number 46**

### **Describe methods of moving nonaggressive exotic animals into and out of cages/enclosures.**

#### **Definition**

Description should include

- the natural nonaggressive and aggressive behaviors of each species of exotic animal (e.g., rodents, rabbits, reptiles, birds, fish)
- the effect of stress on each species
- methods for calming animals prior to moving
- potential safety hazards and restraint issues specific to each species
- identification of potential escape routes and methods of decreasing risk of escape
- standard, safe practices for moving each species.

### **Process/Skill Questions**

- What behaviors would a reptile exhibit to indicate it may respond aggressively to handling?
- Why is it important to examine the type of caging the reptile is in prior to attempting to remove it from the cage?
- What types of restraint equipment could be used to assist in handling a reptile?
- What potential injuries could occur to the animal due to inappropriate restraint and/or handling? What potential injuries could occur to the handler?
- How can using the wrong equipment cause disease or injury to the fish?
- What should be done to prepare a new tank prior to attempting to move the fish?
- What are the methods of safely handling and/or restraining common pet birds?
- Why is it important to understand bird anatomy as it pertains to restraint methods?
- How could a handler minimize stress to a bird during handling?
- What steps should a handler take in moving a bird? How do these steps vary depending on species?

## **Task Number 47**

# **Describe nutritional needs of and feeding procedures for exotic animals.**

## **Definition**

Description should include

- the natural diet of each species of exotic animal
- nutritional needs of each species (e.g., vitamin C for guinea pigs, calcium and vitamin D for reptiles)
- nutritional needs of each species based on digestive physiology (e.g., herbivore/carnivore, cecotrophy)
- common feed types (e.g., seeds, pellets, hay, fresh vegetation) and the pros and cons associated with each
- standard feeding practices for each species
- how life stages and/or overall health may affect food intake (e.g., changes in appetite during nesting, molting, shedding)
- the importance of monitoring food and water consumption
- foods that may cause toxicity issues in specific species (e.g., avocados in certain birds).

## **Process/Skill Questions**

- Why are senior diets lower in protein and higher in fiber than maintenance and growth foods?
- Why are some animals placed on prescription foods regardless of age?
- What type of diet should pregnant or lactating females eat?

## **Task Number 48**

# **Describe restraint procedures to facilitate veterinary examination of exotic animals.**

## **Definition**

Description should include

- industry-standard catching and restraining techniques for each species of exotic animal
- restraint equipment that can be used on each species
- ways to restrain various species during specific procedures (e.g., injection, venipuncture, gavage, wing clip)
- anatomical locations of commonly accessed venipuncture sites
- potential dangers to staff, depending on species, and ways to minimize dangers
- possible injuries to each species that may result from improper restraint (e.g., tail trauma, fur slip, respiratory distress).

## **Process/Skill Questions**

- Why is it important to monitor the bird for signs of stress during restraint for venipuncture?
- How do restraint techniques differ depending on avian species? How do restraint techniques differ depending on which vessel will be used for blood collection?

- Why should the handler take care not to apply pressure to the sternum of the bird?
- What cautions should a handler take when restraining a turtle or tortoise for venipuncture/injection? Why?
- What cautions should a handler take when restraining a snake for venipuncture/injection? Why?
- Why is it especially important to wash one's hands prior to handling snakes?

## **Task Number 49**

### **Explain how to perform a partial water change and filter change on an aquarium.**

#### **Definition**

Explanation should include

- identification of when changing the water and filter is necessary
- reasons for wearing gloves
- the standard procedures that must be followed for changing the water and filter
- reasons for not completely draining the tank.

#### **Process/Skill Questions**

- How often should a filter be replaced?
- How can you determine when a partial water change is necessary?
- How should the replacement water be prepared?
- What might happen if you changed all the water in a fish tank?

## **Understanding Laboratory Procedures**

---



---

### **Task Number 50**

#### **Explain the importance of performing and reporting all laboratory procedures with complete accuracy.**

#### **Definition**

Explanation should include

- types of tests that are performed
- reasons why totally accurate testing and reporting are of crucial importance
- possible consequences of inaccurate testing and reporting.

## **Task Number 51**

### **Describe the management of laboratory samples.**

#### **Definition**

Description should include

- the universal precautions and personal protective equipment (PPE) required
- the types and sizes of containers and other materials (e.g., reagent strips, glass slides, film) needed for sample collection, storage, and analysis
- standard protocols for collection, handling, and storage of samples
- methodology for analyzing samples (e.g., enzyme-linked immunosorbent assay [ELISA] test, direct smear)
- necessary steps for sending samples to a reference laboratory.

## **Task Number 52**

### **Explain the procedure for preparing and staining blood films.**

#### **Definition**

Explanation should include

- the purpose of preparing and staining blood films
- the steps in the procedure for making, staining, and analyzing blood films.

#### **Process/Skill Questions**

- Why is properly preparing and staining a blood film important?

## **Task Number 53**

### **Describe common abnormalities seen in blood films.**

#### **Definition**

Description should include

- the components of blood (red cells, white cells, platelets, plasma) and their functions
- characteristics of normal and abnormal blood films
- common abnormalities in blood films (e.g., anemia)
- methods for identifying abnormalities.

#### **Process/Skill Questions**

- Why are white blood cells important? Why are red cells important?
- 

## **Task Number 54**

### **Perform a urinalysis.**

#### **Definition**

Performance should include

- explanation of the purpose of a urinalysis
- explanation of the methods for collection
- collection of urine samples, using one or more methods
- explanation of the characteristics used to evaluate samples according to industry standards
- evaluation of the samples according to industry standards.

#### **Process/Skill Questions**

- When should a urinalysis be performed?
- What does specific gravity measure?
- What are three ways to measure specific gravity?
- What are the chemical components in urine that are evaluated?

## **Demonstrating Hospital Procedures**

---

---

## **Task Number 55**

### **Identify veterinary instruments and equipment and their uses.**

#### **Definition**

Identification should include

- the most commonly used veterinary instruments, including surgical instruments, and the purpose of each
- classification of instruments (e.g., scissors, needle holders, forceps) according to use
- the basic parts of common surgical instruments (e.g., ratchet, box lock)
- methods of safely handling and passing surgical instruments
- commonly encountered veterinary equipment and the use of each.

#### **Process/Skill Questions**

- What instruments are commonly included in a spay pack? In an emergency pack?
  - What are the uses of the different types of surgical scissors?
  - What ways are veterinary surgical instruments grouped (e.g., curved vs. straight, by tooth patterns, by blade types)?
- 

## **Task Number 56**

### **Describe methods for cleaning, disinfecting, and preparing surgical instruments.**

#### **Definition**

Description should include

- the chemicals and equipment used to clean and disinfect selected surgical instruments
- the steps in the procedures used to clean and disinfect selected surgical instruments
- how to prepare a surgical pack.

#### **Process/Skill Questions**

- Why are instrument packs important in a veterinary setting?
- What differences typically exist between a small animal pack and a pack for large animals? Why?
- What are the differences between a general pack and an emergency pack?
- How is sterilization ensured in the preparation of instrument packs?
- What are the guidelines for identifying sterilized surgical packs?

## **Task Number 57**

### **Explain bandaging and splinting methods.**

#### **Definition**

Explanation should include

- identifying the reasons for application of bandages and splints
- identifying various common bandaging and splinting materials, their properties, and their uses
- selecting the appropriate type of bandage or splint for a given affected area
- describing processes for applying the bandage or splint according to specified procedures
- explaining the principles and steps of basic wound management
- summarizing aftercare procedures for bandages, splints, and casts
- defining complications that may arise secondary to bandages and splints
- identifying methods to ensure bandages and splints do not worsen a condition.

#### **Process/Skill Questions**



- What could swollen or cold toes on a bandaged limb indicate?
- Why is washing or irrigating a wound to remove debris important? What should *not* be used to wash or irrigate an open wound?
- What is the purpose of the primary layer of a bandage? Secondary layer? Tertiary layer?

## **Task Number 58**

### **Identify types of syringes and their uses.**

#### **Definition**

Identification should include the

- parts of a syringe
  - various sizes of syringes and uses of each
  - various gauges of needles and uses of each
  - various types of tips on syringes
  - use of the graduations on a syringe
  - proper method of filling a syringe.
- 

## **Task Number 59**

### **Explain methods of dental care for animals.**

#### **Definition**

Explanation should include

- the anatomy of the tooth, including the differences between a feline/canine tooth and an equine tooth
- the differences in the methods of mastication between different species (e.g., carnivores crush, herbivores grind in a circular motion)
- the importance of dental care in animals
- the signs of poor oral health
- procedures for home dental care, including common products used.

#### **Process/Skill Questions**

- What problems could poor oral health in animals cause? Why?

## **Task Number 60**

### **Explore spaying and neutering options.**

#### **Definition**

Exploration should include

- defining the terms *spay* and *neuter*
- explaining the benefits of spaying and neutering
- explaining the myths associated with spaying and neutering
- listing the considerations used in deciding whether spaying or neutering an animal may or may not be desirable.

## Task Number 61

### Describe preparation of a patient for surgery.

#### Definition

Description should include

- the importance of determining that the patient has fasted appropriately prior to surgery
- identifying and obtaining equipment needed for patient preparation
- hair removal protocols for selected surgical cases (e.g., soft tissue, orthopedic)
- various antiseptic scrubs and solutions, methods of application, and patterns for scrubbing
- potential complications resulting from surgical prep (e.g., clipper irritation/burn, chemical reaction)
- positioning patient for surgery, according to instructions provided.

#### Process/Skill Questions

- What complications could arise if the skin is abraded during surgical preparation?
- When scrubbing a patient, what are the accepted patterns to use when applying solutions?
- What could be done for a particularly dirty animal that is having an elective procedure performed?
- If the veterinary assistant needs additional supplies while preparing a patient for surgery, why should he/she call for assistance rather than going to get the supplies?

## Understand Disease and Disease Prevention

---

---

## Task Number 62

### Explain the concept of disease.

#### Definition

Explanation should include

- definitions of the terms *disease* and *homeostasis*
- factors that contribute to disease (e.g., poor nutrition, poor husbandry, poor sanitation)

- various ways different species show disease.

### **Process/Skill Questions**

- How does the body try to fight off disease-producing agents?
- What signs might be exhibited by an animal that is immunosuppressed?
- Why is it important to understand the effects of maternal antibodies when vaccinating young animals?
- What role does sanitation play in the prevention of disease?

## **Task Number 63**

### **Describe the characteristics of disease-producing agents.**

#### **Definition**

Description should include

- ways the various microbial agents (i.e., viral, bacterial, protozoan, fungal) cause disease, including ways they enter and leave the body
- the concept that microbes present on surfaces can remain infective for various periods of time
- methods for destroying pathogenic organisms.

### **Process/Skill Questions**

- How do viral, bacterial, protozoan, and fungal agents differ from each other?
- How do disease-producing agents spread from one animal to another?
- Why are antibiotics not effective against viral infections?
- What methods exist for decreasing an animal's exposure to infectious organisms?

## **Task Number 64**

### **Explain common animal diseases and their treatments.**

#### **Definition**

Explanation should include

- common animal microbial and dietary diseases, including their signs and symptoms
- the relationship between disease and diet, including how vitamin and mineral deficiencies affect disease susceptibility
- transmission of common animal infectious diseases, including impact of direct and indirect exposure to disease-producing agents
- standard treatments for common animal diseases
- preventive measures for common animal diseases (e.g., vaccination, husbandry practices that can minimize risk of transmission)
- the concept of being immunocompromised (e.g., diabetic, geriatric, affected by long-term steroid use) and thus more susceptible to infectious diseases

- the emerging problem of increasing drug resistance due to overuse of antimicrobials.

## Process/Skill Questions

- How are common diseases of companion animals classified?
- What role do symptoms play in the diagnosis of diseases?
- What are the consequences if hyperthyroidism in a cat goes untreated?
- What must be done if a dog with gastric dilatation/volvulus is to survive?
- What are uroliths? How can they affect the animal? What is the consequence of ignoring them?
- Why is it important to understand how each disease is transmitted from animal to animal?
- What is an epidemic?
- What is the purpose of an isolation room in an animal care facility?
- Why is it important to follow quarantine procedures to the letter?
- Why are ventilation systems so important in an animal care facility? What dangers might they pose?

## Task Number 65

### Describe the concept of immunity.

#### Definition

Description should include

- definition of the term *immunity*
- the immune system and its function
- types of immunity, including differentiation between passive and active immunity
- the methods for acquiring immunity.

#### Process/Skill Questions

- What is an antigen?
- What is an antibody?
- What events could cause an animal to have a weakened immune system?
- Why is immunity to certain diseases so important for animals? For the owners of animals? For other animals in contact?

## Task Number 66

### Explain basic vaccine concepts.

#### Definition

Explanation should include

- the history of vaccine production as it applies to common infectious diseases
- comparing the types of vaccines (e.g., killed, attenuated, toxoid, subunit, conjugate, recombinant, monovalent, multivalent)

- the benefits and risks of using different types of vaccines
- the use of adjuvants and their potential risks
- vaccines that may be administered intranasally
- the meaning of terms such as *three-way* and *four-way* as they apply to vaccines.

### **Process/Skill Questions**

- How has the development of vaccine protocols impacted overall animal health?
- Why were different types of vaccines developed?
- Which type of vaccine conveys longer-lasting immunity but carries greater risk to the vaccinated animal?
- What is usually the causative factor in vaccine reactions?
- Which type of vaccine may cause a mild disease in the vaccinated animal?

## **Task Number 67**

### **Identify common animal diseases that can be prevented by vaccination.**

#### **Definition**

Identification should include

- the diseases that are included in American Veterinary Medical Association (AVMA) and American Association of Feline Practitioners (AAFP) vaccination protocols, as well as American Association of Equine Practitioners (AAEP) guidelines for horses
- the impact of vaccination programs on overall animal health.

### **Process/Skill Questions**

- What vaccines are available now that were not available five years ago? Ten years ago? Twenty years ago?
- What animal diseases have been virtually eradicated in developed parts of the world as a result of vaccine administration?
- How would a change in health status, such as pregnancy, affect the type and method of vaccination employed by the veterinarian?
- What factors have caused the Association of Feline Practitioners to make changes in how frequently feline vaccinations are administered?
- Why might an animal that has received the appropriate vaccines at the appropriate times still become ill with the disease?
- What would be important to include in client education regarding the efficacy of vaccinations?

## **Task Number 68**

### **Describe the factors involved in vaccination schedules.**

#### **Definition**

Description should include

- factors affecting efficacy of vaccines (e.g., presence of maternal antibodies, health status, breed predispositions, environmental risks)
- vaccination protocols established by AVMA, AAEP, AAEP, and local veterinary schools for selected species (e.g., dogs, cats, horses, ferrets)
- reasons for not vaccinating an animal (e.g., potential for anaphylaxis, chronic debilitating disease)
- use of antibody titers as an emerging method of assessing immunity to certain diseases and of avoiding over-vaccination
- vaccinations dictated by state law or other legal mandates (e.g., interstate/international travel restrictions).

### **Process/Skill Questions**

- Why is a vaccination schedule important to an animal's health?
- What factors should be considered in establishing a vaccination schedule for an animal?
- Why should animals younger than six weeks not receive vaccinations in most cases?
- What factors should be considered when vaccinating young puppies?
- How often are booster vaccinations administered, and why might these recommendations change?
- What vaccinations are required by law to be administered by a certain age? Why?

## **Task Number 69**

### **Explain concepts of animal quarantine.**

#### **Definition**

Explanation should include

- criteria by which to decide to place an animal in quarantine/isolation
- how quarantine programs prevent spread of disease to established populations
- important aspects of quarantine-facility design, including ventilation
- protective clothing and sanitation requirements utilized in isolation wards
- laws pertaining to animal quarantine and situations in which quarantine of an animal is legally required (e.g., human bite, overseas travel).

### **Process/Skill Questions**

- Why would a client be advised to keep a new cat away from currently owned cats for a period of time, even if the new cat looks healthy?
- What are the recommendations from the American Animal Hospital Association regarding isolation of sick animals?
- What are the local laws pertaining to the quarantine of an animal that has bitten a human?
- How does hospital sanitation and staff cleanliness impact the prevention of disease spreading from a quarantined animal to healthy animals?
- Is there such a thing as an "insignificant breach" of quarantine procedure? Why, or why not?

## **Task Number 70**

# **Describe common diseases and their symptoms in companion animals.**

## **Definition**

Description should include

- classifying the common diseases of companion animals
- identifying the primary symptom(s) of each disease
- explaining transmission of each disease.

## **Task Number 71**

# **Describe treatments and preventive measures for common diseases.**

## **Definition**

Description should include

- identifying common vaccinations and their purposes
- explaining the impact of adequate sanitation, ventilation, and aseptic technique on disease prevention
- identifying isolation and quarantine procedures.

# **Understanding Parasitology**

---

---

## **Task Number 72**

# **Explain concepts of parasitology.**

## **Definition**

Explanation should include

- defining *parasitology* and associated terms (e.g., *parasite*, *host*, *intermediate host*, *ova*, *larvae*, *vector*)
- classification of parasites (ectoparasites, endoparasites)
- the diagnosis of parasites
- the treatments for parasites.

## **Process/Skill Questions**

- Why are parasites harmful to animals?
- How do endoparasites and ectoparasites differ?

- What common parasites are a problem for domestic animals? What are some traditional methods for preventing these parasites?
- How can parasites on a pet be harmful to the pet owner?

## **Task Number 73**

### **Identify parasites that commonly affect animals.**

#### **Definition**

Identification should include

- intestinal parasites (e.g., ascarids, or roundworms; hookworms; whipworms; tapeworms; giardia) during different developmental stages
- external parasites (e.g., fleas, mites, ticks) during different developmental stages
- heartworm (microfilaria and adult)
- parasites with zoonotic potential.

#### **Process/Skill Questions**

- What distinguishing characteristics are used to identify parasites?
- What cultural practices benefit from host specificity?
- Why is it difficult to determine if an animal has an internal parasite?
- What techniques are commonly used to check for fleas?
- Why should a dog that tests positive for heartworms not continue taking a heartworm preventive?

## **Task Number 74**

### **Explain the life cycle of parasites and its relationship to parasitic infestation, detection, and treatment.**

#### **Definition**

Explanation should include

- stages of the life cycle of parasites
- ways the life cycle impacts parasitic infestation
- ways the life cycle impacts detection and treatment
- ways animals acquire parasites (e.g., ingestion, tissue migration, environmental exposure).

#### **Process/Skill Questions**

- How is heartworm transmitted? How do veterinary professionals test for this disease? What is the treatment? What role, if any, does life cycle play in the transmission, testing, and treatment of heartworm?
- Why is heartworm usually fatal if not treated? What medical problems might a dog encounter after treatment for heartworm?



- Why are fecal samples important when diagnosing internal parasites?
- What are the similarities and differences between the indirect and direct life cycles of parasites?

## **Task Number 75**

### **Describe the clinical signs and symptoms of common parasitic infestations.**

#### **Definition**

Description should include

- the signs and symptoms exhibited by an animal with each common parasitic infestation
- the acute and chronic effects of parasitism
- the signs of parasitism in humans.

#### **Process/Skill Questions**

- Since the majority of animals are asymptomatic, how are parasitic infestations detected?
- What are the long-term effects of parasitic infestation in animals?

## **Task Number 76**

### **Explain standard diagnostic procedures for determining the presence of parasites.**

#### **Definition**

Explanation should include

- how to perform a gross exam, direct smear, and skin scraping
- how to perform a fecal float in sugar solution and in salt solution, including the difference between a fecal float on small animals and a fecal egg count on horses and other large animals
- how to obtain and store parasite samples for testing
- how to use a microscope to identify parasites in feces, blood, skin, or hair.

#### **Process/Skill Questions**

- How is a viable sample collected?
- How is each diagnostic test performed?

## **Task Number 77**

# Describe preventive measures and common treatments for parasitic infestation.

## Definition

Description should include

- husbandry practices that limit an animal's exposure to parasites
- common preventive drug treatments for parasitic infestation
- common drug treatments for parasitic infestation, including rotational deworming vs. strategic deworming based on fecal egg counts in horses
- other common treatments for parasitic infestation, including treatment of the environment.

## Process/Skill Questions

- Why must most treatments for internal parasites be repeated in three weeks?
- What are some alternatives to flea dipping and “bombing” one’s house to eradicate flea infestation?
- Why is flea prevention important in the prevention of tapeworms?

# Understanding Veterinary Pharmacology

---

---

## Task Number 78

### Explain the concept of pharmacology.

#### Definition

Explanation should include

- a definition of *pharmacology* as the study of drugs
- ways drugs are used to treat and prevent animal disease as well as animal suffering
- dosing terminology and abbreviations (e.g., *efficacy*, *contraindication*, AU, BID, PO)
- handling and disposing of expired medications
- drug schedules 1–5, the regulations associated with each schedule, and their potential for abuse.

#### Process/Skill Questions

- How does preventive medication available for treating certain problems help improve the quality of life for pets?
- Why is it important to have a basic knowledge of dosing terminology and abbreviations when working at a veterinary clinic?
- In what ways might expired medications be hazardous?
- How is regulation of veterinary drugs and prevention of drug abuse handled in a veterinary setting?

- What are the regulating agencies for veterinary drugs?
- Why is it important that certain drugs be stored in locked cabinets with only selected personnel having access?
- What types of veterinary products are regulated by the Environmental Protection Agency (EPA)?

## **Task Number 79**

### **Describe local, state, and national organizations that focus on animal protection and health.**

#### **Definition**

Description should include the goals, purposes, and standards of

- professional organizations specific to the field of veterinary medicine (e.g., American Animal Hospital Association [AAHA], National Association of Veterinary Technicians of America [NAVTA])
- professional organizations affiliated with the veterinary field (e.g., AHA, National Dog Groomers Association of America [NDGAA])
- local animal support organizations (e.g., humane shelters, animal control organizations).

#### **Process/Skill Questions**

- What organizations deal primarily with training or educational issues versus hands-on animal care?
- What is the difference between the Society for the Prevention of Cruelty to Animals [SPCA] and the U.S. Humane Society?
- What types of breed rescue associations are available in your area? What is their main focus?
- What impact does membership in a professional organization have on a business's clientele?
- How would professional membership in an organization help a veterinarian, veterinary assistant, groomer, trainer, or other animal care professional attract new clients?
- Why is an inspection process important in maintaining the high standards of an organization?

## **Task Number 80**

### **Describe the categories of commonly used veterinary medications.**

#### **Definition**

Description should include

- the categories of commonly used veterinary medications (e.g., antiparasitics, antibiotics, diuretics)
- the purposes and common side effects of drugs in each category
- examples of commonly used drugs in each category
- the indications for uses of these drugs.

#### **Process/Skill Questions**

- How can familiarity with commonly used veterinary drugs help provide greater safety to the patient and greater client satisfaction?
- How can knowledge of commonly used veterinary drugs help prevent potential drug interactions?
- What is the importance of staying current on new veterinary drugs as they become available? How can this be done?
- What is the importance of educating a client about common side and/or adverse effects of veterinary drugs?

## **Task Number 81**

### **Describe routes of medication administration.**

#### **Definition**

Description should include

- the standard routes of medication administration (e.g., topical, parenteral, oral)
- the advantages and disadvantages of the various routes, including comparison of the absorption rates and ease of administration
- appropriate injection sites.

#### **Process/Skill Questions**

- What medication administration route has the slowest rate of absorption? What route has the fastest rate of absorption?
- Why are absorption rates of importance in medication administration?
- In what type of situation might a slower absorption rate be preferred?

## **Task Number 82**

### **Determine the best method for administering a medication.**

#### **Definition**

Determination should include

- listing the possible methods for administering the specified medication
- listing the equipment necessary for administering the medication in each method
- considering the factors used to decide the best method of administration (e.g., behavior of animal, drug formulation, potential for irritation)
- stating the reasons for preferring one method over others.

#### **Process/Skill Questions**

- Why must multiple factors be considered when determining the best method for medication administration?

- How may the level of an animal's aggression when handled affect the decision about the best method of medication administration?
- Why would oral administration of a drug not be recommended for an animal with vomiting and/or diarrhea?

## **Task Number 83**

### **Describe factors that affect dose determination.**

#### **Definition**

Description should include

- the ways that an animal's health history can impact dose determination
- the ways that an animal's genetics, metabolism, age, sex, size, and health status can impact dose determination
- the importance of referencing drug inserts, labeling guidelines, and other drug instructions
- the reason dose determination can be affected by whether the medicine is intended for human consumption.

#### **Process/Skill Questions**

- Why might an animal such as a mouse require proportionately more of a drug than a large dog?
- Why is it important to know when the last dose of a drug would need to be administered when treating a dairy cow or pig?
- Why might two animals of equal species, breed, and weight who have undergone the same procedure require different doses of the same medication?

## **Task Number 84**

### **Calculate dosages for weight-based medications.**

#### **Definition**

Calculation should include

- identifying drugs that may be administered by a veterinarian assistant under the supervision of a veterinarian (outlined in the Virginia Regulations Governing the Practice of Veterinary Medicine)
- following a weight-based dosage chart to calculate dosages for animals of various weights without error
- calculating drug dosages with 100-percent accuracy.

#### **Process/Skill Questions**

- Why must dosages be calculated with 100-percent accuracy? What might be the consequences of even a small calculation error?
- If heartworm preventive is available in packages for dogs up to 25 lbs., for dogs from 26-50 lbs., and for dogs from 51-100 lbs., what package(s) would you need to use for an animal that weighs 115 lbs.?

- How much wormer medication would a 7-pound kitten need if the bottle says to administer 1.0 ml per 10 lbs.?

## **Task Number 85**

### **Interpret information on medication labels.**

#### **Definition**

Interpretation should include

- the type of medication and its use
- the dosage appropriate for a particular animal
- the recommended route(s) for administering the medication
- the possible side effects or adverse reactions
- summarizing the laws governing the labeling and administration of medicines.

#### **Process/Skill Questions**

- What information appears on medication labels? Why?
- Why is it important to understand all information on a medication label?
- Why is it important to understand the laws governing labeling and administration of medicines?
- What guidelines apply to the selection of the best route for administration?

## **Task Number 86**

### **Explain the importance of avoiding specific drug combinations.**

#### **Definition**

Explanation should include the importance of

- knowing the adverse effects of common specific drug combinations
- consulting sources of information about adverse effects of specific drug combinations when unsure
- obtaining an accurate medical history, including any over-the-counter drugs the animal may be receiving
- explaining drug-combination information to a client, as directed by the prescribing veterinarian.

#### **Process/Skill Questions**

- Why is it ultimately the responsibility of the veterinarian to identify the potential for an adverse drug interaction?
- In the event that the veterinarian prescribes a medication, why is it important to ask a client if he or she is giving a pet any vitamins or products purchased elsewhere?
- When explaining the possible adverse effects a medication can have on an animal, what steps can be taken to ensure the client understands why he or she should not give certain medications in combination?

## **Task Number 87**

### **Describe administration of oral and topical medications.**

#### **Definition**

Description should include

- the importance of verifying patient identification and rechecking drug labels
- ways the form of the medication (e.g., paste, liquid, pill) affects the administration technique
- standard practices for medication administration, including “pilling,” restraint procedures, and aseptic techniques
- ways to prevent an animal from disturbing topically applied medications
- drugs that may pose an exposure risk to humans if absorbed through the skin.

#### **Process/Skill Questions**

- What can be done to encourage a dog or cat that is holding a pill in its mouth to swallow the pill?
- What problems could arise from trying to hide a medication in food?
- How is it possible to get a thick topical medication out of a jar without contaminating the contents of the jar?
- What problems arise when applying topical medications to an area the animal can reach by grooming itself? What could be done to prevent these problems?

## **Task Number 88**

### **Describe how to prepare and dispense medications that a client will administer at home.**

#### **Definition**

Description should include

- commonly used terminology and abbreviations
- ways to rewrite prescription instructions in layman’s terms
- items required on a medication label to be sent home with a client
- available prescription packaging (e.g., child-proof containers, tubes, bottles)
- methods for ensuring accurate drug and concentration identification
- methods for accurately dispensing medications (e.g., pill counting tray)
- importance of client education when dispensing medications for client to administer at home.

#### **Process/Skill Questions**

- Why are totally clear written instructions for medication administration essential for clients who will be administering medications at home?
- Why should jargon and abbreviations be avoided in such instructions?
- In what methods of drug administration might the client need instruction?

- How can a client be sure a pet swallows a pill?

## **Task Number 89**

### **Explain the different levels of control for medications.**

#### **Definition**

Explanation should include

- identifying the roles of regulating agencies, such as the FDA, EPA, and USDA
- identifying Virginia Board of Veterinary Medicine regulations that mandate who can and cannot administer drugs based on schedule and route of administration
- describing the schedule of controlled substances and applicable state/federal laws
- describing storage and inventory procedures for medications and controlled substances.

#### **Process/Skill Questions**

- What are the different schedules of drugs? What are the different regulations associated with each schedule? Why are there different regulations associated with each schedule?
- Why is it important that certain drugs be stored in locked cabinets with only selected personnel having access?
- What types of veterinary products are regulated by the EPA?

## **Performing Mathematical Operations (Posology)**

---

---

## **Task Number 90**

### **Complete basic four-function operations with whole numbers, fractions, and decimals.**

#### **Definition**

Demonstration should include

- explaining the importance of accurate mathematical calculations in veterinary science
- explaining the consequences of inaccurate mathematical calculations in veterinary science
- performing mathematical operations with applications.

#### **Process/Skill Questions**

- Why are accurate mathematical operations critical?



- What veterinary tasks must be conducted with the use of mathematical operations?
- 

## **Task Number 91**

### **Identify basic units of the commonly used systems of measurement.**

#### **Definition**

Identification should include the basic units of the avoirdupois, apothecary, metric, and U.S. customary systems.

#### **Process/Skill Questions**

- Why are different systems of measurement used?
- Why must workers in the veterinary industry be skillful in using the basic units of all commonly used systems of measurement?
- What could be the consequences of confusing two different systems of measurement when measuring?

## **Task Number 92**

### **Perform conversions between common systems of measurement.**

#### **Definition**

Demonstration should include

- listing volume and weight equivalents
- converting between metric units (e.g., milliliters and liters)
- converting between pounds and kilograms
- converting between metric units and avoirdupois units
- converting fluid ounces to various units in the avoirdupois system (e.g., cups, gallons, quarts, pints, tablespoons, teaspoons).

#### **Process/Skill Questions**

- If a container holds 1,000 ml of fluid, how many liters of fluid does it hold?
- If a container holds 1.2 liters of fluid, how many milliliters (ml) of fluid does it hold?
- If the level of fluid in a liter IV bag reads at the 300 mark, how many milliliters have been administered?
- An animal weighs 100 lbs. The prescription designates the amount needed “per kg.” How many kg does the animal weigh?
- What are the steps for converting 1,000 ml to quarts?
- What are the steps for converting 2 cups to milliliters?
- A dog consumes 3 bowls of water (approximately 1-quart capacity bowl) in a day. How many milliliters of water does the dog consume?
- Six tablespoons equals how many ounces? How many cups?
- A container holds  $\frac{1}{2}$  gallon of fluid. This is the equivalent of how many ounces of fluid?

- The directions call for a dilution ratio of 2 ounces per gallon of water. You desire to produce 1 quart of solution. How much of the substance will you add to the quart of water?

## **Task Number 93**

### **Measure liquids.**

#### **Definition**

Measurement should include

- selecting and using a variety of measuring devices (e.g., graduated cylinders, measuring cups, measuring spoons, various syringes)
- measuring selected liquids to a teacher-specified degree of accuracy.

#### **Process/Skill Questions**

- How can you decide which measuring device is best suited to the task at hand?
- What is a meniscus?
- To measure 3 cubic centimeters of a liquid, what measuring device should be used?
- To dilute one ounce of disinfectant with one gallon of water, what tool would be the most appropriate to measure the disinfectant?
- Among the graduated cylinder, measuring cup, measuring spoon, and syringe, which measuring device provides the most accuracy?

## **Task Number 94**

### **Dilute liquids, following label directions.**

#### **Definition**

Dilution should include

- reading and analyzing the directions
- preparing diluted solutions according to directions with 100-percent accuracy.

#### **Process/Skill Questions**

- Why is it important to follow the manufacturer's directions for dilution of a product?
- Why is 100-percent accuracy necessary when preparing diluted solutions?
- The manufacturer lists the shampoo as needing to be diluted in a 9:1 ratio. How would one prepare this dilution?
- What would be the steps for preparing one quart of instrument milk, using the 1:6 dilution ratio?

## **Task Number 95**

## Calculate amounts for dilutions.

### Definition

Calculation should include

- defining *solute* and *solvent*
- describing how to calculate and prepare a dilution in terms of the relationship between solute and solvent (e.g., 1:3)
- describing how to calculate a percent concentration
- calculating amounts for selected dilutions to a teacher-specified degree of accuracy.

### Process/Skill Questions

- What operations are required to complete advanced mathematical calculations?
- Why are conversion operations necessary for completing these calculations?
- The directions require a dilution ratio of 1:3. How many ounces of the chemical will be used to create 1 quart of the substance?
- You need 4 liters of a solution. The label indicates that you would use 5 ml per liter of water. How many milliliters will you add to your 4 liters of water?

## Task Number 96

### Solve word problems associated with veterinary medicine.

#### Definition

Solution should include

- analyzing the word problem to identify the known information and the needed information
- expressing the problem as a mathematical formula
- identifying the strategy for solving
- solving the formula.

#### Process/Skill Questions

- How can dimensional analysis be applied to solving posology problems?
- What types of mathematical applications are necessary for the accurate solution of such problems?

## Exploring First Aid on Animals

---

---

### Task Number 97

# **Explain the concept of first aid and its importance to the veterinary assistant's work.**

## **Definition**

Explanation should include

- defining *first aid*
- goals of first aid (e.g., prevent condition from becoming worse, provide pain relief)
- techniques involved in initial care (e.g., attending to ABCs—airway, breathing, circulation; controlling hemorrhage)
- ways to secure the environment and provide for human safety
- basic measures that can be performed “in the field”
- instructing a client over the phone in basic first aid measures to provide to an animal.

## **Process/Skill Questions**

- What are some situations a veterinary assistant might encounter that would require first aid?
- What steps could a veterinary assistant take to help assess a patient’s condition when speaking with a client over the telephone?
- What measures should be taken to ensure the safety of a person performing first aid?

## **Task Number 98**

### **Describe the components of a pet first-aid kit and the uses of each.**

#### **Definition**

Description should include

- sources pertaining to the assembly of a basic pet first-aid kit
- the items that should be included in the first-aid kit (e.g., gauze pads, scissors, ice packs, thermometer), including supplies to prepare for a disaster
- the way each item should be used.

#### **Process/Skill Questions**

- What basic first aid equipment should be included in a first-aid kit for animals?
- When would a person administering first aid use an ice pack? Tweezers?
- What first-aid items should *not* be used without instructions from a veterinarian?

## **Task Number 99**

### **Identify common situations and conditions requiring first aid.**

#### **Definition**

Identification should include

- common situations and conditions that typically require first aid (e.g., wound, breathing difficulty, hyperthermia, bleeding, burn, poisoning, reaction to insect sting, seizure)
- common situations and conditions that typically require immediate veterinary intervention
- ways to determine whether a situation or condition requires first aid or immediate veterinary intervention
- the importance of discussing any abnormality with a veterinarian
- ways to take an adequate history from a client.

### **Process/Skill Questions**

- What should be the first thing a veterinary assistant does when assessing an animal's condition?
- What signs might be seen in a pet that has been stung by an insect?
- How would an animal with heat exhaustion look?

## **Task Number 100**

### **Describe how to prioritize common emergencies.**

#### **Definition**

Description should include

- defining the term *triage*
- identifying common veterinary emergencies (e.g., hit by a car [HBC], anaphylaxis, straining to urinate, bleeding, diarrhea, shock, burn, poisoning, insect sting, choking)
- importance of identifying vital signs and evaluating airway, breathing, and circulation
- importance of "seeing the big picture" when assessing a patient and not focusing exclusively on the most obvious injury or sign
- ways to assess a patient's condition based on signs as well as factors such as age, weight, sex, and reproductive status (signalment)
- ways to prioritize common emergencies and decide the treatment required.

### **Process/Skill Questions**

- What should be the first thing the veterinary assistant does when assessing an animal's condition?
- How could a veterinary assistant differentiate between arterial and venous bleeding?
- Why could an injury in a very young animal be a higher priority than the same injury in an adult animal?
- What are the ABCs of initial care? What could happen if the veterinary assistant stopped to perform first aid on a fractured limb before checking the ABCs on the patient?
  
- Why should clients be advised to call anytime their animal is doing something out of the ordinary, even if an obvious emergency does not exist?
- Why should any dog hit by a car be taken to a veterinarian even if it appears to be unhurt after the accident?
- What signs would indicate that an animal is experiencing breathing difficulty?

## Task Number 101

### Identify local resources for animal care.

#### Definition

Identification should include

- types of veterinary facilities (e.g., clinic, hospital, referral practice, medical center)
- uses of each type, including for emergency treatment
- roles of animal control, wildlife facilities, foster groups, and similar organizations.

#### Process/Skill Questions

- Why should an animal *not* be taken to an emergency clinic for some conditions, such as a broken toenail that is bleeding?
  - What are some examples of situations when animal control should be called for assistance?
- 
- 

## Maintaining Professional and Ethical Standards

---

---

## Task Number 102

### Explain the relationship between animal welfare and the animal rights movement.

#### Definition

Explanation should include

- the concepts of animal welfare through history
- the AVMA's animal welfare principles
- development of the animal rights movement in the early 1970s
- local animal welfare and animal rights groups
- the impact animal welfare and animal rights groups have had on society as well as on the lives of animals.

#### Process/Skill Questions

- How do different cultures view the role that animals play in society?

- What are some of the fundamental differences between animal welfare and the animal rights movement?
- What is the viewpoint of those more extreme individuals who refer to themselves as animal liberationists? What is their effect on society?

## Task Number 103

### Describe ethical standards for veterinary practice.

#### Definition

Description should include

- the standards for veterinary ethics of the AVMA and Society for Veterinary Medical Ethics (SVME)
- the nature of the veterinarian-client-patient relationship
- the veterinary practice's role as advocate for the animal, including the concept that their primary responsibility to the patient is to relieve disease and suffering while minimizing pain and fear
- important ethical goals, such as relieving animal suffering; promoting public health; assuming responsibility for actions and judgments; maintaining confidentiality, honesty, trustworthiness, and integrity; and striving to improve standards of professional practice
- actions/behaviors that would conflict with ethical standards for veterinary practice.

#### Process/Skill Questions

- How do veterinary professionals act as advocates for public health in the area of zoonotic disease control?
- Why is it unethical for a veterinarian to prescribe or dispense medication without the existence of a veterinarian-client-patient relationship?
- Why is it unethical to release contents of a medical record without first obtaining the consent of the client?
- What is the difference between ethics and legality?
- What roles do professional organizations play in the protection of animals and veterinary employees? What roles do the state and federal governments play?
- In Virginia, how do the legal responsibilities of a veterinarian and a veterinary assistant differ? How are they similar?
- Are the ethical responsibilities of a veterinarian and a veterinary assistant different from each other? Why, or why not?
- Why do veterinary medical professionals have an obligation to honor verbal contracts as well as written contracts with their clients?
- Why is it unprofessional and unethical to misrepresent one's level of training to a client or prospective employer?
- How would failing to fulfill one's duties at work affect one's professional image?

## Performing Office Functions

---



---

## **Task Number 104**

### **Explain the layout of the veterinary facility and rationale for the design.**

#### **Definition**

Explanation should include

- a comparison of typical physical layouts of veterinary facilities
- consideration of both function and aesthetics
- reasons for specific layout features.

#### **Process/Skill Questions**

- Why is it necessary to separate the “front” of an animal care facility from the “back”?
  - Why should each facility have an isolation room?
  - What role should aesthetics play in the physical layout of an animal care facility?
  - What technology issues should be considered when planning the physical layout of an animal care facility?
  - What features are common to most animal care facilities? What features are nice to have but are not essential?
- 

## **Task Number 105**

### **Maintain working knowledge of current veterinary-specific computer software.**

#### **Definition**

Maintenance should include

- exploring commonly used software for veterinary practice management
- identifying sources for information about new software and systems
- describing the importance of continuing education to keep up with technology changes.

#### **Process/Skill Questions**

- Why are many veterinary hospitals moving toward paperless practices by using veterinary-specific software?
- What front desk procedures are accomplished more quickly by using software?

## **Task Number 106**



## **Check client in and out.**

### **Definition**

Check-in and check-out should include

- demonstrating professionalism and good customer-service practices
- prioritizing important tasks and demonstrating the appropriate amount of multitasking when dealing with client face to face
- demonstrating writing and speaking skills
- collecting and accurately recording all necessary information and materials from client upon check in
- providing client with all necessary information upon check out
- explaining the need for maintaining client confidentiality.

### **Process/Skill Questions**

- What are some potential problems resulting from employee inaccuracy when checking in a client? When checking out a client?
- What is the importance of a client's first and last impression? How can a veterinary assistant ensure the best possible first and last impressions?
- How can a veterinary assistant personalize a client's visit? What is the importance of this technique?
- How can the need to multitask sometimes create challenges for providing excellent customer service?
- In what ways are writing and speaking skills important for a veterinary assistant?
- What is the importance of having client sign a release form (service agreement), providing permission to give care to the animal?
- What are some possible consequences of not ensuring proper animal-owner identification upon check in or check out?

## **Task Number 107**

### **Maintain animal owner identification.**

#### **Definition**

Maintenance should include techniques for maintaining accurate and organized identification of animals while they are housed in the facility, such as use of cage cards, temporary collars, a service board, microchips, and pet records.

#### **Process/Skill Questions**

- Why is it important to remove an animal's collar before putting it in a kennel?
- What type of information should be placed on the service board?
- What type of information should be written on a cage card?
- What are some possible consequences of not ensuring proper animal-owner identification?

## **Task Number 108**

## **Describe how to handle client inquiries about products or services.**

### **Definition**

Description should include

- common animal care products, both new and old
- common animal services
- ways to relay product information clearly and accurately to clients.

### **Process/Skill Questions**

- Why is it important to educate clients about products?
  - Why should the veterinary assistant keep up-to-date on the newest products available in the animal care field? How can one keep up-to-date on new products?
- 
- 

## **Exploring Emerging Technologies in Veterinary Sciences**

---

---

### **Task Number 109**

## **Identify current and emerging technologies and advances in veterinary science.**

### **Definition**

Identification should include researching, listing, and defining recent and/or emerging technological tools and advances in the field such as use of

- digital radiology
- ultrasonography
- specialized surgical techniques
- specialized drug therapies
- regenerative therapies (e.g., stem cell therapy)
- complementary medicine (e.g., chiropractic, acupuncture, laser therapy, and herbal therapies)
- social media.

### **Process/Skill Questions**

- Why is it important for a veterinary assistant or technician to be knowledgeable about emerging technologies and the latest advances in veterinary sciences?
- What resources are needed by a veterinary assistant to keep abreast of the newest technologies and advances?
- How can an animal health care worker be sure he/she is up to date on the latest advances in the field?
- Why would one use alternative medicine on an animal?
- What are some specialized drug therapies used on animals?

## **Task Number 110**

### **Explain the concept of biotechnology as related to veterinary science.**

#### **Definition**

Explanation should include

- definition of *biotechnology*
- biotechnology techniques used (e.g., embryo transfer, stem cell therapy, recombinant vaccines)
- genomics
- ways advances in biotechnology have impacted animal health (e.g., identification of disease-causing genes, tests to determine whether an animal carries a gene(s) for a disease).

#### **Process/Skill Questions**

- Who is working on the Dog Genome Project?
  - What breeds and traits have been studied in the Dog Genome Project?
  - Why do the American Kennel Club and the United Kennel Club want breeders to use deoxyribonucleic acid (DNA) testing?
- 
- 

## **Understanding Genetics and Breeding**

---

---

### **Task Number 111**

#### **Explain the relationship among genes, chromosomes, and deoxyribonucleic acid (DNA).**

##### **Definition**

Explanation should include

- defining the terms *gene*, *chromosome*, and *DNA*
- the ways genes, chromosomes, and DNA are related
- the significance of the fact that the number of chromosomes in a cell is species-specific
- sex-linked traits (e.g., tortoiseshell color pattern) and chromosomal abnormalities (e.g., hemophilia, malocclusion).

### Process/Skill Questions

- How many chromosomes do humans have?
- How many chromosomes do dogs have?

## Task Number 112

### Explain the formation of gametes and zygotes and their relationship to inherited traits.

#### Definition

Explanation should include

- defining relevant terms
- the stages of meiosis
- the concepts of codominance, epistasis, and incomplete dominance.

### Process/Skill Questions

- How can animals showing no signs of a genetic disease produce offspring with that disease?
- What is meant by the term *homozygous recessive*? Why is this important in animal breeding?
- What are the sex chromosomes? Why is this important in animal breeding?

## Task Number 113

### Describe the use of genetics in selective breeding.

#### Definition

Description should include

- the impact of chromosomal abnormalities on animal health
- how a pedigree chart identifies potential recessive allele carriers
- the benefits of genome research for breeding programs.

### Process/Skill Questions

- Why would one avoid breeding an animal that phenotypically demonstrates a disease condition?

- If an individual animal demonstrates an extraordinary characteristic, why do the offspring of this animal sometimes fail to meet the expectations of the breeder?
- Humans have bred dogs selectively to have a huge range of characteristics within one species. What are some important genetic traits and the breeds in which they are commonly found?

## Task Number 114

### Compare outcrossing/mixed breeding, line breeding, and inbreeding.

#### Definition

Comparing should include

- defining relevant terms
- outlining the similarities and differences among the different types of breeding
- identifying the reasons for and potential outcomes of the different types of breeding
- common genetic disorders and their signs
- ways breeding programs are used to reduce genetic disorders.

#### Process/Skill Questions

- Why might a breeder consider inbreeding?
- What is linebreeding? Why is it used?
- Of outcrossing, line breeding, and inbreeding, which program is least likely to produce conditions caused by homozygous recessives?

## Task Number 115

### Describe breeding cycles.

#### Definition

Description should include

- the phases of the estrous cycle, which varies from species to species
- signs exhibited during each phase
- breeding behavior of both female and male
- mechanics of breeding, including artificial insemination
- pregnancy diagnosis, gestation periods, and stages of labor
- causes and signs of dystocia.

#### Process/Skill Questions

- How can the breeder determine whether the female is ready to be bred?
- What is meant by the term *estrus cycle*?
- Why is it desirable for the breeder to know exactly when the female is ready to be bred?

- What is the connection between the female’s estrus cycle and the horse breeder who must ship the mare to the stud farm for service?
- Why do horse breeders use teaser stallions?
- In dogs, what is meant by a “tie”? What is its effect?
- In breeding rodents, what is meant by a “harem”? What are the pros and cons of this breeding method?

## **Task Number 116**

### **Analyze the ethical aspects of breeding.**

#### **Definition**

Analysis should include

- reasons for using criteria for choosing a reputable breeder (e.g., Orthopedic Foundation for Animals (OFA) registry, sire/dam on site, veterinary referral)
- situations in which a purebred dog may be desirable (e.g., livestock work, guide dogs)
- the impact of breeder actions that deviate from kennel-club standards
- the operation of puppy mills
- quality of life of the breeding stock and their offspring
- how selective breeding programs are used to minimize genetically linked diseases.

#### **Process/Skill Questions**

- What questions should breeders ask themselves prior to breeding an animal?
- How can a breeder ensure that his or her animal is worthy of being bred?

## **Working with Wildlife**

---



---

## **Task Number 117**

### **Identify wildlife species common to the locale.**

#### **Definition**

Identification should include

- the names of common native wildlife species
- a physical description, habitat information, diet, and other pertinent information about each species.

#### **Process/Skill Questions**

- What impact has habitat destruction had on wildlife in your area?

- What, if any, species of native wildlife in your area are protected/endangered? What types of protection does this include?
- Why is it important to protect endangered species?

## **Task Number 118**

### **Locate a wildlife rehabilitator for a given species.**

#### **Definition**

Locating should include

- identifying local and regional resources for wildlife rehabilitation
- describing the role of the Virginia Department of Game and Inland Fisheries in wildlife rehabilitation.

#### **Process/Skill Questions**

- If the rehabilitator you located is a private individual, what training did he/she need to care for a given species?
- How does the person/center handle receiving new patients? What are the hours of operation?

## **Task Number 119**

### **Describe provision of interim care to injured or orphaned wildlife.**

#### **Definition**

Description should include

- safety issues specific to working with various species of wildlife (e.g., protection from teeth, claws, beaks, talons)
- ways to determine whether an animal is orphaned
- the reasons for seeking counsel from a veterinarian or licensed wildlife rehabilitator, if possible, before attempting to provide any care
- identifying those species that are protected by laws and should be turned over to a licensed person or wildlife hospital immediately
- husbandry and nutritional needs unique to various species.

#### **Process/Skill Questions**

- Why is it detrimental to the animal for a person not experienced in caring for wildlife to attempt to care for it rather than turning it over to a licensed person or wildlife hospital?
- How can one tell if an animal has truly been orphaned?
- What issues exist when individuals choose to rehabilitate a species that might pose a threat such as rabies?

## **Task Number 120**

# Explain legal issues affecting the care and handling of wildlife.

## Definition

Explanation should include

- species that are protected by laws such as the Migratory Bird Treaty Act and the Endangered Species Act
- state and local laws governing wildlife
- ways such laws impact the care and handling of wildlife (e.g., who is allowed to care for certain species and who is not)
- the legal criteria for licensure.

## Process/Skill Questions

- Other than by enacting laws that affect the care and handling of wildlife, how does the state protect a species (e.g., nesting sites, eggs, habitat preservation)?
- What are the various permit levels a wildlife rehabilitator can obtain through the Virginia Department of Game and Inland Fisheries? What do the different permit levels allow a rehabilitator to do?

## SOL Correlation by Task

39	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 11.3, 11.5, 12.3, 12.5
40	Participate in an SAE.	English: 11.5, 11.8, 12.5, 12.8
41	Identify the benefits and responsibilities of FFA membership.	English: 11.5, 11.6, 11.7, 11.8, 12.5, 12.6, 12.7, 12.8
42	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 11.5, 12.5  History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHII.8, WHII.10, WHII.11
43	Apply for an FFA degree and/or an agricultural proficiency award.	English: 11.5, 12.5
44	Explain husbandry of exotic animals.	English: 11.5, 12.5
45	Describe how to lift and carry exotic animals.	English: 11.5, 12.5
46	Describe methods of moving nonaggressive exotic animals into and out of cages/enclosures.	English: 11.5, 12.5
47	Describe nutritional needs of and feeding procedures for exotic animals.	English: 11.5, 12.5
48	Describe restraint procedures to facilitate veterinary examination of exotic animals.	English: 11.5, 12.5
49	Explain how to perform a partial water change and filter change on an aquarium.	English: 11.5, 12.5
50	Explain the importance of performing and reporting all laboratory procedures with complete accuracy.	English: 11.5, 12.5  Science: BIO.1, CH.1
51	Describe the management of laboratory samples.	English: 11.5, 12.5



52	Explain the procedure for preparing and staining blood films.	English: 11.5, 12.5
53	Describe common abnormalities seen in blood films.	
54	Perform a urinalysis.	English: 11.5, 12.5 Science: CH.1
55	Identify veterinary instruments and equipment and their uses.	
56	Describe methods for cleaning, disinfecting, and preparing surgical instruments.	English: 11.5, 12.5
57	Explain bandaging and splinting methods.	English: 11.3, 11.5, 12.3, 12.5
58	Identify types of syringes and their uses.	
59	Explain methods of dental care for animals.	English: 11.5, 12.5
60	Explore spaying and neutering options.	English: 11.3, 11.5, 12.3, 12.5
61	Describe preparation of a patient for surgery.	English: 11.5, 12.5
62	Explain the concept of disease.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.4
63	Describe the characteristics of disease-producing agents.	English: 11.5, 12.5 Science: BIO.4
64	Explain common animal diseases and their treatments.	English: 11.5, 12.5
65	Describe the concept of immunity.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.4
66	Explain basic vaccine concepts.	English: 11.3, 11.5, 11.8, 12.3, 12.5, 12.8 Science: BIO.3, BIO.4
67	Identify common animal diseases that can be prevented by vaccination.	English: 11.5, 11.8, 12.5, 12.8 Science: BIO.4
68	Describe the factors involved in vaccination schedules.	English: 11.5, 12.5
69	Explain concepts of animal quarantine.	English: 11.5, 12.5
70	Describe common diseases and their symptoms in companion animals.	English: 11.5, 12.5
71	Describe treatments and preventive measures for common diseases.	English: 11.5, 12.5
72	Explain concepts of parasitology.	English: 11.3, 11.5, 12.3, 12.5
73	Identify parasites that commonly affect animals.	English: 11.5, 12.5 Science: BIO.4
74	Explain the life cycle of parasites and its relationship to parasitic infestation, detection, and treatment.	English: 11.5, 12.5 Science: BIO.4
75	Describe the clinical signs and symptoms of common parasitic infestations.	English: 11.5, 12.5
76	Explain standard diagnostic procedures for determining the presence of parasites.	English: 11.5, 12.5

77	Describe preventive measures and common treatments for parasitic infestation.	English: 11.5, 12.5
78	Explain the concept of pharmacology.	English: 11.3, 11.5, 11.8, 12.3, 12.5, 12.8
79	Describe local, state, and national organizations that focus on animal protection and health.	English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.8, GOVT.15
80	Describe the categories of commonly used veterinary medications.	English: 11.5, 12.5
81	Describe routes of medication administration.	English: 11.5, 12.5
82	Determine the best method for administering a medication.	English: 11.5, 11.6, 11.7, 12.5, 12.6, 12.7
83	Describe factors that affect dose determination.	English: 11.5, 12.5
84	Calculate dosages for weight-based medications.	Mathematics: A.1, A.4 Science: CH.1
85	Interpret information on medication labels.	English: 11.5, 12.5
86	Explain the importance of avoiding specific drug combinations.	English: 11.5, 12.5
87	Describe administration of oral and topical medications.	English: 11.5, 12.5
88	Describe how to prepare and dispense medications that a client will administer at home.	English: 11.5, 12.5
89	Explain the different levels of control for medications.	English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.14, VUS.8
90	Complete basic four-function operations with whole numbers, fractions, and decimals.	
91	Identify basic units of the commonly used systems of measurement.	Science: CH.1
92	Perform conversions between common systems of measurement.	Science: CH.1
93	Measure liquids.	Science: CH.1
94	Dilute liquids, following label directions.	English: 11.5, 12.5
95	Calculate amounts for dilutions.	English: 11.3, 11.5, 12.3, 12.5 Science: CH.4
96	Solve word problems associated with veterinary medicine.	Mathematics: A.4
97	Explain the concept of first aid and its importance to the veterinary assistant's work.	English: 11.3, 11.5, 12.3, 12.5
98	Describe the components of a pet first-aid kit and the uses of each.	English: 11.5, 12.5
99	Identify common situations and conditions requiring first aid.	English: 11.5, 12.5
100	Describe how to prioritize common emergencies.	English: 11.3, 11.5, 11.8, 12.3, 12.5, 12.8
101	Identify local resources for animal care.	
102	Explain the relationship between animal welfare and the animal rights movement.	English: 11.5, 12.5

		History and Social Science: GOVT.11, GOVT.15
103	Describe ethical standards for veterinary practice.	English: 11.5, 12.5 History and Social Science: GOVT.16
104	Explain the layout of the veterinary facility and rationale for the design.	
105	Maintain working knowledge of current veterinary-specific computer software.	English: 11.5, 12.5 History and Social Science: VUS.14 Mathematics: COM.10, COM.17
106	Check client in and out.	English: 11.2, 11.5, 12.5 History and Social Science: GOVT.16
107	Maintain animal owner identification.	English: 11.5, 12.5
108	Describe how to handle client inquiries about products or services.	
109	Identify current and emerging technologies and advances in veterinary science.	English: 11.5, 12.5 History and Social Science: VUS.14 Science: BIO.1
110	Explain the concept of biotechnology as related to veterinary science.	
111	Explain the relationship among genes, chromosomes, and deoxyribonucleic acid (DNA).	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.5
112	Explain the formation of gametes and zygotes and their relationship to inherited traits.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.5
113	Describe the use of genetics in selective breeding.	English: 11.5, 12.3, 12.5 Science: BIO.5, BIO.7
114	Compare outcrossing/mixed breeding, line breeding, and inbreeding.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.5, BIO.7
115	Describe breeding cycles.	English: 11.5, 12.5
116	Analyze the ethical aspects of breeding.	English: 11.5, 11.8, 12.5, 12.8
117	Identify wildlife species common to the locale.	English: 11.5, 12.5
118	Locate a wildlife rehabilitator for a given species.	English: 11.5, 11.8, 12.5, 12.8
119	Describe provision of interim care to injured or orphaned wildlife.	English: 11.5, 12.5
120	Explain legal issues affecting the care and handling of wildlife.	English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.8, GOVT.9, GOVT.10, GOVT.15

# FFA Information

The National FFA is an organization dedicated to preparing members for leadership and careers in the science, business, and technology of agriculture. Local, state, and national activities and award programs provide opportunities to apply knowledge and skills acquired through agriculture education.

For additional information about the student organization, see the [National FFA website](#) and the [Virginia FFA Association website](#).

The following career development events are available for this course:

- [Agricultural Communications](#)
- [Agronomy](#)
- [Environmental & Natural Resources](#)
- [Farm and Agribusiness Management](#)
- [Floriculture](#)
- [Food Science and Technology](#)
- [Forestry](#)
- [Marketing Plan](#)
- [Nursery/Landscape](#)

## Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”

## Teacher Resources

- **Virginia Board of Veterinary Medicine:** <https://www.dhp.virginia.gov/vet/>
- **Merck Veterinary Manual:** <http://www.merckvetmanual.com/>
- **Small Animal Care Safety Contract:**  
<http://cteresource.org/attachments/anr/veterinary/Animal%20Safety%20Contract.docx>
- **Canine Acute Pain Scale:** <http://cteresource.org/attachments/anr/veterinary/Dog%20Pain%20Scale.pdf>
- **Feline Acute Pain Scale:**  
<http://cteresource.org/attachments/anr/veterinary/CSU%20Acute%20Pain%20Scale%20Feline.pdf>
- **Equine Comfort Assessment Scale:**  
<http://cteresource.org/attachments/anr/veterinary/Anesthesia%20Pain%20Management%20Pain%20Score%20Equine.pdf>
- **New Client Form:** <http://cteresource.org/attachments/anr/veterinary/New%20Client%20Form.docx>

- **Pet Release Form:** <http://cteresource.org/attachments/anr/veterinary/Pet%20Release%20Form.docx>

# Appendix: Credentials, Course Sequences, and Career Cluster Information

## Industry Credentials: Only apply to 36-week courses

- Animal Systems Assessment
- Beef Quality Assurance Examination
- Canine Care and Training Program- Level 1 Certification Examination
- Certified Veterinary Assistant (CVA) Examination (AAH)
- Certified Veterinary Assistant Examination
- College and Work Readiness Assessment (CWRA+)
- Customer Service Specialist (CSS) Examination
- Fundamentals of Animal Science Certification Examination
- Meat Evaluation Certification Examination
- National Career Readiness Certificate Assessment
- Pet Sitters Certification Examination
- Principles of Livestock Selection and Evaluation Certification Examination
- Small Animal Science and Technology Assessment
- Veterinary Medical Applications Examination
- Workplace Readiness Skills for the Commonwealth Examination

**Concentration sequences:** *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Agricultural Business Fundamentals I (8022/36 weeks)
- Agricultural Business Management III (8026/36 weeks)
- Agricultural Business Operations II (8024/36 weeks)
- Biological Applications in Agriculture (8086/36 weeks)
- Biotechnology Applications in Agriculture (8087/36 weeks)
- Biotechnology Foundations in Agricultural and Environmental Science (8085/36 weeks)
- Biotechnology Foundations in Health and Medical Sciences (8344/36 weeks)
- Equine Science (8015/18 weeks)
- Equine Science (8080/36 weeks)
- Equine Science, Advanced (8094/36 weeks)
- Introduction to Animal Systems (8008/36 weeks)
- Livestock Production Management (8012/36 weeks)
- Small Animal Care I (8081/18 weeks)
- Small Animal Care I (8083/36 weeks)
- Small Animal Care II (8084/36 weeks)
- Veterinary Science I (8088/36 weeks, 140 hours)

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	Occupations
Agribusiness Systems	Farm, Ranch Manager Farmer/Rancher
Animal Systems	Animal Breeder, Husbandry Animal Geneticist

<b>Career Cluster: Agriculture, Food and Natural Resources</b>	
<b>Pathway</b>	<b>Occupations</b>
	<b>Animal Nutritionist</b> <b>Aquacultural Manager</b> <b>Poultry Manager</b> <b>Veterinarian</b> <b>Veterinary Technician</b>
<b>Environmental Service Systems</b>	<b>Secondary School Teacher</b> <b>Toxicologist</b>
<b>Natural Resources Systems</b>	<b>Ecologist</b> <b>Fish and Game Officer</b> <b>Fisheries Technician</b> <b>Microbiologist</b> <b>Park Technician</b> <b>Range Technician</b> <b>Wildlife Manager</b>

<b>Career Cluster: Health Science</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Biotechnology Research and Development</b>	<b>Biochemist</b> <b>Cell Biologist</b> <b>Medical, Clinical Laboratory Technician</b> <b>Research Assistant</b>
<b>Diagnostics Services</b>	<b>Medical, Clinical Laboratory Technician</b> <b>Medical, Clinical Laboratory Technologist</b> <b>Phlebotomist</b>
<b>Health Informatics</b>	<b>Epidemiologist</b>
<b>Therapeutic Services</b>	<b>Medical Assistant</b> <b>Pharmacy Technician</b> <b>Registered Nurse</b> <b>Surgeon</b> <b>Surgical Technologist</b> <b>Veterinary Assistant</b> <b>Veterinary Technologist</b>

<b>Career Cluster: Science, Technology, Engineering and Mathematics</b>	
<b>Pathway</b>	<b>Occupations</b>
<b>Science and Mathematics</b>	<b>Animal Nutritionist</b> <b>Animal Scientist</b> <b>Microbiologists</b> <b>Toxicologist</b> <b>Veterinarian</b> <b>Veterinary Assistant</b>