

VETERINARY TECHNICIAN & SCIENCE PARTNERSHIPS



K-12 outreach, veterinary professionals, and veterinary lesson plans in promotion of science by the Texas A&M University College of Veterinary Medicine and Biomedical Sciences.



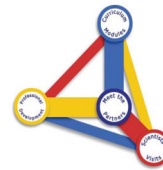
GK-12



NIH





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www.cvm.tamu.edu

Partnership for Environmental Education and Rural Health
Department of Veterinary Integrative Biosciences,  | 
Brittany Sanchez, Dr. William Klemm, and Dr. Larry Johnson

Letter from the Principal Investigator



The goals of this monograph are to describe veterinary-related outreach activities in the Texas A&M University College of Veterinary Medicine & Biomedical Sciences; honor and highlight the training and path of veterinary technical professionals; and provide lesson plans with teacher professional development opportunities for the high school agricultural science veterinary assistant's program. Hence, this partnership monograph promotes careers in science (e.g., veterinary assistant and veterinary technician); describes the training for and specific paths taken to become a veterinary technician; and honors outstanding veterinary technicians.

About Dr. Johnson:

Larry Johnson, professor in the Department of Veterinary Integrative Biosciences at Texas A&M University, has published over 110 original, peer-reviewed, scientific journal articles; given invited scientific talks on four continents; won a national research award; served on a research panel for the United States Congress; served on NIH, NSF, USDA, NIMHD, and NIOSH grant review panels; received NIH and/or NSF funding for over 25 years; served on editorial boards of three scientific journals; and received both college-level and university teaching awards for his histology courses. He also received the Texas A&M University Chapter of Sigma Xi Science Communication Award 2001, the Association for Former Students Distinguished Achievement Award 2007, and the Bush Excellence Award for Faculty in Public Service 2009.

The partnership includes teachers and students of high schools, vocational agriculture veterinary assistants' programs, veterinary technician programs, veterinarians, and the College of Veterinary Medicine & Biomedical Sciences at Texas A&M University.

In providing role models for youth interested in science or in becoming a veterinary technician, this program provides a model for enriching health science education in secondary schools and higher education through veterinary technician and science partnerships.

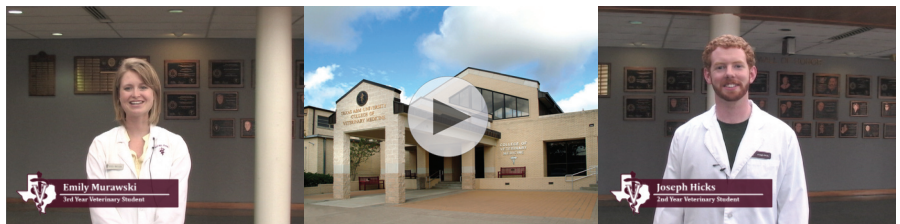
The Veterinary Black Bag program (VBB; <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp>) is aimed at curriculum development, teacher professional development, and school visits by scientists (veterinarians, veterinary students, and veterinary technicians) in public schools.

All accomplishments of the veterinary technician and science partnership and other PEER resources and activities are made possible by funding from NSF and NIH (NCCR, SEPA) and through the efforts of dedicated students (undergraduate and graduate), teachers, staff, and faculty. For their dedication to the mission and effort to improve science education, I thank them. – Larry Johnson

Tour of Texas A&M University College of Veterinary Medicine



For a video tour of the only veterinary college in Texas, visit our website at peer.tamu.edu. You can also find more information on personal guided tours at vetmed.tamu.edu!



About Christopher Prigmore: Christopher Prigmore has worked for PEER since January 2009 and has specialized in computer resources and IT assistance. Christopher recorded and produced the video tour of the College of Veterinary Medicine and Biomedical Sciences mentioned above. He also records and edits scientific presentations given by veterinarians, veterinary technicians, veterinary students, and professors. Christopher graduated with a Bachelor's degree in Civil Engineering in 2011 and is continuing to graduate school to study Environmental Engineering at the University of Washington.

Veterinary Technician & Science Partnerships

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On the Cover: A student from Blinn College's Veterinary Technology Program shows Girl Scouts various specimens in the gross anatomy lab at the Veterinary School Open House.

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About Brittany Sanchez: Brittany Sanchez has worked for PEER since September 2008 creating lesson and activity plans, making posters for GK-12 conferences, and assisting her graduate Fellow in and out of the classroom. Brittany initially chose to major in communication/graphic design, however, that changed after she decided instead to recognize her strengths in mathematics and science. She graduated with a Bachelor's degree in Biomedical Engineering in 2011 and is continuing to graduate school to study Biostatistics at the University of Washington.



OUTREACH ACTIVITIES

PART I

PEER Overview

Goals and Roles of the PEER Program

Quick Definitions

PEER- Partnership For Environmental Education and Rural Health; outreach component of CERH (see below). Visit peer.tamu.edu for more information.

NSF- the National Science Foundation, which supplies part of PEER grant funding. Visit www.nsf.gov for more information.

NIEHS- the National Institute of Environmental Health Sciences, which supplies part of PEER grant funding. Visit www.niehs.nih.gov for more information.

CERH- the Center for Environmental and Rural Health, parent organization of PEER, with the goal of promoting rural health awareness. Visit cerh.tamu.edu for more information.

CVM- the Texas A&M College of Veterinary Medicine and Biomedical Sciences.

NSF GK-12 Undergraduate Fellow- an undergraduate student at Texas A&M University who assists in developing activities for use in middle and high school classrooms.

Teacher/Content Specialist- teachers who create and modify lesson plans to enhance academic performance of middle and high school students in STEM, plan and present professional development workshops for teachers across the state, and mentor veterinary and undergraduate students to improve their pedagogical, communication, and teamwork skills.

STEM- Science, technology, engineering, and mathematics, the areas of education where American children perform below the world average.

TEKS- Texas Essential Knowledge and Skills, Texas educational standards for each grade level.



The PEER program strives to inspire the next generation of researchers in academia, industry, and government through its three main objectives; curriculum development, professional development, and promotion of science within the classroom.

1) Curriculum development: As the primary grant that funds PEER is the SEPA grant for middle school outreach, most PEER materials focus on grades 6-8. This includes health science, integrated, and veterinary-related curricula. Recently, PEER has begun working with high school agriculture teachers through the veterinary assistant program. PEER has trained over 150 high school agriculture teachers through its agriculture science curriculum workshops. Teachers from both middle and high school can access and browse the PEER website for lesson materials covering a variety of subjects. If the lesson they are looking for is not on the website, teachers are able to submit an online request. These teacher requested resources allow teachers across the state and in remote areas access to PEER lesson plans, presentations, activities, and information.

2) Professional development: PEER hosts science and health workshops that provide teachers with the resources they need to address TEKS effectively in the classroom. Teachers learn how to deliver lessons that captivate students' interest and motivate them to learn the required curriculum. PEER has trained over 2,000 teachers through its workshops, giving teachers the tools to make a difference in the lives of their students.

3) Promotion of science within the classroom: PEER capitalizes on veterinary school resources like equipment, veterinary students, specimens, etc. to reach out to and educate the community about different areas of science. Schools can open their doors to PEER presentations or visit Texas A&M and attend a PEER lecture to reach their students and directly influence them with PEER teaching methods. For example, students can visit Texas A&M University and attend the PEER "Careers in Science" presentation where they are exposed to the fantastic realm of science and shown how many opportunities that any career in science can provide. Scientists, veterinarians, and veterinary and graduate students have presented science to 52,400 students and their 2,300 teachers. ■

1 PEER.TAMU.EDU

How to search for and access PEER curriculum materials.

Step 1: Type "peer.tamu.edu" into your browser

Step 2: Click on the "Teacher Resources" tab and then scroll down to "Lessons: Teacher Requested Resources"



How to search for and access the High School Agricultural Science materials.

Step 1: Type "peer.tamu.edu" into your browser

Step 2: Click on the "Teacher Resources" tab and scroll down to "High School Agricultural Science"

Step 3: Choose a Module (In the preview the "Vaccination" module is shown)

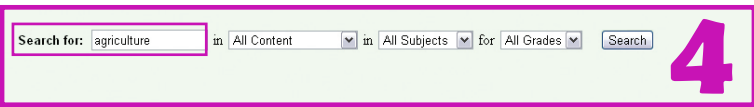
Step 4: Click on the plus signs next to the lessons to see the drop-down menu of materials

Step 5: Click any link on the menu to view the materials, which include PowerPoints, Lab Activities, Tutorials, Worksheets, Instructions, Videos, and much more!

Step 6: Use and ENJOY the materials!!!

Step 3: Click on "Search" to search for materials on a certain topic, such as agriculture

Step 4: Search for specific teacher requested lesson plans OR search the entire PEER website for materials



Teacher Requested Resources:

Search for: agriculture in All Content in All Subjects for All Grades Search

Search Results for the Word(s): agriculture Un-Highlight Search Terms

Found: 3 Entries Viewing 1 - 3

Title of Presentation or Activity	Description
Careers in Science Booklet	This booklet contains information about careers in science. Many diverse careers are featured along with self-tests for students, puzzles, games, and real life examples of scientists. Keywords: career, science, zoology, oceanography, forensics, engineering, astronomy, geology, medicine, agriculture
How does your Garden Grow	This is a PowerPoint Presentation meant to introduce students to the advantages and disadvantages of using chemicals in an agricultural setting Keywords: chemicals, garden, agriculture
Texas Crops 1800-1940	This is a powerpoint containing information on the 5 major crops in Texas during the 1800s and early 1900s. Cotton, wheat, sorghum, corn and rice were very profitable for Texas farmers and important crops in shaping Texas' history. The presentation also contains information about climate, pests and other problems that affected Texas agriculture . Keywords: cash crops, texas, 1800s



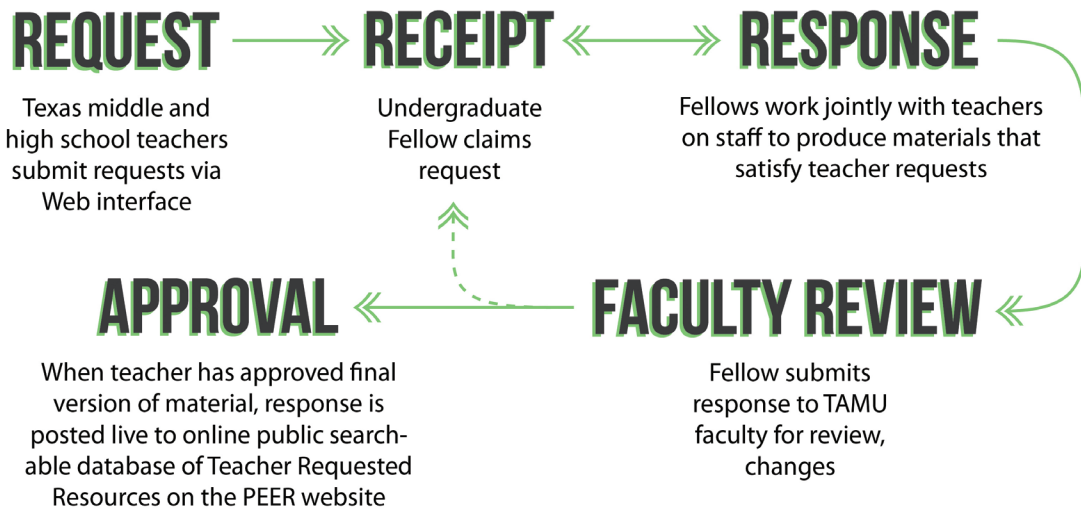
High School Agriculture Lessons

Module	Lessons
Neutering	<ul style="list-style-type: none"> Castrating Farm Animals and Race Horses Reproductive Hormones Video: Veterinary Presentation on Neutering
Parasites	<ul style="list-style-type: none"> Parasite Host Relationship Video: Veterinary Presentation on Parasites
Vaccination	<ul style="list-style-type: none"> The Immune System Pathogens <ul style="list-style-type: none"> Read Me First Statement Lesson Plan PowerPoint (Pathogens) PowerPoint (Pathogen Graphic Organizer) Infectious Disease Spread Activity Student Infectious Disease Spread Activity Teacher Health Record Case Studies Small Animal Vaccination Protocols Pet Health Record.pdf Rabies Video: Veterinary Presentation on Vaccinations

A large blue number '4' is overlaid on the bottom left of the table, and a large green number '5' is overlaid on the bottom right of the table.

Teacher Requested Resources

Barclay Bell



Don't have access to many resources for your classroom? Stuck on how to present a difficult concept? Because many teachers have limited time and budgets, it can be challenging to develop lessons that are cutting edge and fun, especially in more rural areas.

PEER's Teacher Requested Resources is an online interface through which teachers receive personal assistance with science and math-related questions.

These resources allow teachers in remote areas of the state and around the world to request websites, activities, and even customized lesson plans, which our undergraduate Fellows create with the assistance of middle school teachers on staff. School teachers

Here's an example of a real request and the response:

Teacher's Request: "I need information on agricultural weed, insect and soil fertility control equipment. I need a powerpoint, worksheets, whatever...to help the students understand the hazards, the safety equipment, and licenses, how to determine what and why you use chemicals in an agricultural setting."

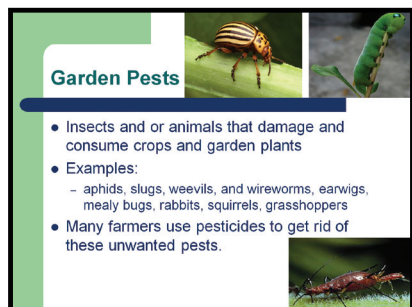
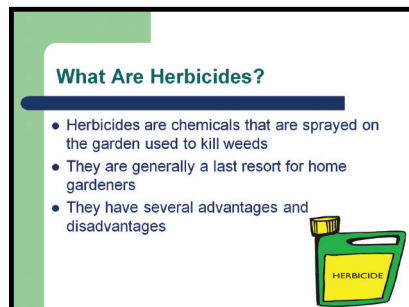
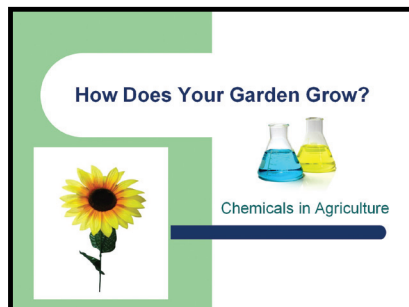
Response: Development of a 16-slide PowerPoint presentation on the advantages and disadvantages of using chemicals in an agricultural setting including a lesson plan. To find this lesson, search for "Garden" at http://peer.tamu.edu/DLC/NSF_Resources.asp. ■

are able to send specific requests to better meet their needs both in terms of subject area and lesson depth.

Once a response has been produced, it is evaluated for content by STEM faculty and for public school and age-appropriateness by middle school teachers.

The outcome? A searchable library with nearly 500 lesson plans! (http://peer.tamu.edu/DLC/NSF_Resources.asp)

Maybe you have an idea for a lesson that involves video editing, but don't have the resources to create it? Request it! Maybe you need new ideas on presenting a difficult concept? Request it! Need websites to help students practice algebra? Request it!



Stimulating interest in K-12 science and math education, showing students the “real world” applications of math and science, and generating interest in careers in biomedical sciences have been goals of the PEER program since its beginning. To help achieve these goals, the PEER program has developed many lessons, activities, and resources for K-12 teachers to use in their classrooms.

PEER
Partnership for Environmental Education and Rural Health

Science Resources for the Middle and High Schools

Home | Teacher Resources | Request a Lesson Plan | Teacher Workshops | Videos | NSF GK-12 Program | Vet Veterinarians

Contact Us
Veterinary and Science Partnership Lessons
Take Home Brochures
Web Video Presentations
Web Presentations
Workshop Description
Benefits to Veterinarians
Past Lessons
Program Summary

Copyright © 2008
Public School Collaborators
Donor(s) Disease
Sponsored Regional
Sci12 Site

Veterinary and Science Partnership Lessons for Teachers

Module	Lessons
Clinical Trials	<ul style="list-style-type: none"> Application of Scientific Method through Clinical Trials Data Analysis through Clinical Trials Video: Veterinary Presentation on Clinical Trials
Scientific Inquiry	<ul style="list-style-type: none"> Critical Appraisal of Research
Animal Research	<ul style="list-style-type: none"> Use of Animals in Research and Education Non-Human Primates in Research Video: Veterinary Presentation on Animal Research
Diabetes	<ul style="list-style-type: none"> The Endocrine System and Hormones How the Body Obtains and Uses Energy Video: Veterinary Presentation on Diabetes
Heart Disease	<ul style="list-style-type: none"> Heart Function Heart Disease Video: Veterinary Presentation on the Heart
Nutrition and Growth	<ul style="list-style-type: none"> Nutrition, Growth and Lifespan Structure and Function of the Digestive System Exercise and Nutrition Video: Veterinary Presentation on Nutrition and Growth
Vaccination - Infectious Diseases	<ul style="list-style-type: none"> Structure and Function of the Immune System Classification of Living Organisms Including Infectious Agents Classification & Understanding Interactions of Infectious Agents Scientific Inquiry: Problem Solving through Rabies Video: Veterinary Presentation on Vaccinations
Behavior	<ul style="list-style-type: none"> Animal Behavior Isolation Island Brain Function Human Behavior Learning and Memory Video: Veterinary Presentation on Behavior
Parasites	<ul style="list-style-type: none"> Parasite Host Relationships Video: Veterinary Presentation on Parasites
Orthopedics	<ul style="list-style-type: none"> Effect of Exercise on Bone Structure Effect of Nutrition on Bone Structure and Function Orthopedics Experiment Design Video: Veterinary Presentation on Orthopedics
Physical Exam	<ul style="list-style-type: none"> Application of the Scientific Method through Physical Exam Sound, Waves, and Electromagnetic Spectrum Temperature, Heat and Thermal Energy Video: Veterinary Presentation on Physical Exam
Arthritis	<ul style="list-style-type: none"> Arthritis and the Joints Video: Veterinary Presentation on Arthritis
Neutering	<ul style="list-style-type: none"> Reproductive System of Farm Animals Sexual Hormones Video: Veterinary Presentation on Neutering
Dental Health	<ul style="list-style-type: none"> Oral Health and Dental Health Oral Health in Medicine, Safety and Use Video: Veterinary Presentation on Dental Health

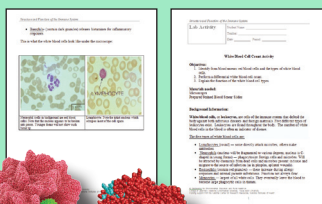
The PEER Veterinary Black Bag Curriculum (<http://peer.tamu.edu/VBB/ScienceTeacherResources.asp>) is designed to use students’ natural interest in animals to motivate them to learn their required science curriculum and to stimulate their interest in careers in science. Veterinarians are involved as local science experts to interact with middle school students. Materials are provided for veterinarians to present to students on various topics in animal health. These topics include diabetes, animal research, clinical trials, vaccination, the physical exam process, and many others. Materials provided for the veterinarians include PowerPoint presentations, complete presentation plans, videos, and activities. Videos of veterinarians and veterinary students are provided for classroom and veterinary clinic use. Teachers are provided with complete follow-up lessons that tie the veterinarian’s presentation topic to the science standards they are required to teach. The follow-up lessons include detailed lesson plans, materials lists, hands-on activities, rubrics for grading, PowerPoint presentations, and games. These lessons feature the “real world” application of the science that the students are learning in class and highlight the many career options available in science. The lessons also demonstrate how issues in animal health are closely related to human health issues. Students see how they can learn about themselves by studying animals.

The PEER Agricultural Science/Veterinary Assistants Curriculum (<http://peer.tamu.edu/VBB/AgTeacherResources.asp>) includes lessons on veterinary topics that are designed for high school Agricultural Science students, especially those in Veterinary Assistants training programs. The lessons include materials for veterinarians to present in the classrooms as well as videos of veterinarians and veterinary students for teachers to use in the classrooms. Detailed lessons are provided that address the content and skills necessary for veterinary assistants courses. Activities include tasks such as completing a pet health and vaccination record, recognizing common parasites and their life cycles, modeling the transmission of infectious diseases, conducting a differential white blood cell count, and doing a fecal egg count. PowerPoint presentations and other lesson materials incorporate basic content as well as current research topics to enhance students’ knowledge and stimulate their interest in varied career options in clinical and research fields. The activities and content of these lessons are rigorous and developed by a team – Texas A&M College of Veterinary Medicine and Biomedical Sciences faculty and teachers – to address the growing needs of Veterinary Medical Assistants programs. ■

High School Agriculture Lessons

Module	Lessons
Neutering	<ul style="list-style-type: none"> Castrating Farm Animals and Race Horses Reproductive Hormones Video: Veterinary Presentation on Neutering
Parasites	<ul style="list-style-type: none"> Parasite Host Relationship Video: Veterinary Presentation on Parasites
Vaccination	<ul style="list-style-type: none"> The Immune System <ul style="list-style-type: none"> Read Me First Statement Lesson Plan PowerPoint (Immunity) White Blood Cell Count Activity How to Draw a Blood Smear Slide Pathogens <ul style="list-style-type: none"> Lesson Plan PowerPoint (Pathogens) PowerPoint (Pathogen Graphic Organizer) Infectious Disease Spread Activity Student Infectious Disease Spread Activity Teacher Health Record Case Studies Small Animal Vaccination Protocols Pet Health Record.pdf Rabies <ul style="list-style-type: none"> Read Me First Statement Lesson Plan PowerPoint (Rabies) Rabies Webquest Sheet Rabies Webquest Instructions Video: Veterinary Presentation on Vaccinations <ul style="list-style-type: none"> Veterinarian Video Download PowerPoint Vet Student Video Download PowerPoint

Vaccinations: Immunity



The Body Fights Back; 2 Ways

- Surface Barriers Keep Intruders Out**
 - Prevents entry of antigens inside our body
 - Skin, Mucosa
- Two Immune Mechanisms:**
 - Cell Mediated Immunity:** Cell activates itself to defend against the intruder
 - Humoral Immunity:** Cell produces antibodies carried in blood to control the intruder

Integrated Curricula & Life Science Online

Michele Ward

The PEER Integrated Middle School Curricula (<http://peer.tamu.edu/MiniMods.asp>) are designed for Middle School use and are created around an adventure story. A recurring cast of middle school characters, the “Back Pack Club,” has a time-travel pocket digital assistant that allows them to travel to different parts of the world at different historical periods. Each module features a different theme. The settings of these time-travel stories reflect state social studies standards: In Texas, 6th graders learn world history, 7th graders learn Texas history, and 8th graders learn U.S. history. To add a science component to the stories and to help teachers meet the state science standards, each adventure includes environmental health science problems for students to solve. These have included allergies and asthma; poisoning from food, water or air; exposure to chemical hazards and carcinogens; nutritional disorders; and assorted infectious diseases. Together, these lessons teach science (including combating infections, the scientific method, tobacco and nicotine addiction, and water purification), English/language arts (including parts of speech, persuasive writing, summaries, and comparing and contrasting), math (including area/volume calculations, circumference, geometric shapes, length conversions, and metric multiplication factors), and social studies (including climate, precipitation, climograph, and absolute location).

PEER Biology and Environmental Health Curriculum (http://peer.tamu.edu/curriculum_modules/) contains six web-based modules covering a variety of middle school science topics. There are three biology modules—Cells Are Us, Organ Systems, and Ecosystems—and three environmental health science modules—Water’s the Matter, Toxic or Not, and Properties of Hazards. Modules are designed to encourage students to think about the topics, not just to memorize facts. Important environmental issues such as water quality and pollution are covered. A Hazards Index (http://peer.tamu.edu/curriculum_modules/Hazards_index/environmental_hazards_index.htm) covers diverse issues such as acid rain, sunburn, and viruses. A popular feature of this curriculum is the “Story Time” (http://peer.tamu.edu/curriculum_modules/storytime/index.htm) section that gives biosketches of famous scientists who made some of the discoveries presented in the content sections, including interesting details about the scientists’ upbringing and challenges they faced on their paths to discovery. These modules also contain two sections not found in other, more traditional materials: “Why it Matters” shows students why they should care about the content of the modules and “How We Know” shows what strategies, methods, and instruments are used in discovery. ■

PEER Agricultural Science Workshops

Torri Whitaker

During the months of June and July 2011, the PEER program hosted its inaugural Agricultural Science Curriculum Workshops.

These workshops were designed specifically to assist agricultural

science teachers in the development and enhancement of curriculum used in their classrooms. The one-day workshop included lectures on current veterinary medical topics from leading Texas A&M veterinarians and scientists and the debut of two “Veterinary Black Bag” modules created for high school agricultural science teachers.

Dr. Larry Johnson began the day with an overview of the PEER program and instructions on how to ac-



Simulation of the spread of disease.



Classifying organisms.



Exploring PEER veterinary-related curriculum materials.

cess the free online resources and materials available on the PEER website (peer.tamu.edu).

Dr. Christine Budke, Assistant Professor and Principal Investigator for Education and Outreach with the

tension Program Leader for Veterinary Medicine, began the afternoon session with a lecture on current issues in animal health and a preview of his new “Veterinary Assistant Handbook” designed for use in the Veterinary Medicine Applications course.

Participants then had the opportunity to examine the “Parasites” module. Once again, attendees were given an overview of the lesson plan and an opportunity to try-out some of the hands-on activities.

Finally, Dr. Thomas Craig, Professor of Veterinary Pathobiology, spoke on current issues and research in parasite resistance.

Feedback from teachers participating in the workshop included the following responses:

“I think the [PEER Agricultural Science] curriculum is great. I have been to multiple Vet Med workshops, and this one by far is the best.” – Haley Harris, Joshua ISD

“I think this [PEER Agricultural Science] curriculum is an excellent resource for my students. I love that it incorporates new and exciting technology that will keep my students engaged and interested.” – Trisha Brown, LCISD

“The [PEER Agricultural Science] curriculum is a great resource since it brings information and hands-on activities together.” – Elizabeth Rudd, Dallas ISD

If you would like more information on attending future workshops hosted by the PEER program, visit our website (peer.tamu.edu) and click on the “Teacher Workshops” link. ■

10 Veterinary Technician & Science Partnerships

Boy Scout Interface

Barclay Bell & Brittany Sanchez

To celebrate the 100th anniversary of the Boy Scout organization, the Sam Houston Area Council (SHAC) put together the SHAC Jam at the Texas World Speedway on October 8-10, 2010. Over 20,000 Scouts, leaders, and family members attended the event with over four acres of activities for Cub Scouts, Boy Scouts, and the co-ed Venturing division for teens.

Activities included scouting skills such as shooting sports, outdoor cooking, crafts, and high adventure. Starting Friday, thousands of Scouts pitched tents for overnight camping.

The PEER program had a booth in one of the many Scout city “subdivisions” for teaching Scouts how to earn various merit badges with our lesson modules. Brightly colored posters, hands-on activities and, a basset hound caught Scouts’ attention.

The PEER program currently offers badge opportunities for dentistry, environmental science, dog care, veterinary medicine, personal fitness, and pets.

To download these lesson modules visit <http://peer.tamu.edu/VBB/BoyScoutResources.asp> ■



BADGE OPPORTUNITIES

DENTISTRY



Requirement 2a.: Tell or write about what causes dental decay and gum disease. Tell how each of the following contributes to dental decay and gum disease: bacterial plaque, sugars, and acid.

Dental Health Module: Bacteria and Dental Health Lesson includes how sugars, acids, and plaque contribute to dental decay.

Requirement 5b.: How the mouth is related to the rest of the body. Topics might include chewing, saliva, enzymes, nutrition and speech.

Nutrition and Growth Module: Structure and Function of the Digestive System PowerPoint presentation includes description of the structure of the mouth and its functions.

Requirement 2d.: Discuss with your counselor the roles a veterinarian plays in laboratory animal medicine and research.

Animal Research Module: Use of Animals in Education and Research Lesson PowerPoint includes the guidelines for using and caring for laboratory animals, including veterinary care. There is also an informative veterinary video on the use of animals in research included in this module.



VETERINARY MEDICINE

ENVIRONMENTAL SCIENCE



Requirement 3a1.: Conduct an experiment to find out how living things respond to changes in their environments. Discuss your observations with your counselor.

Behavior Module: Animal Traits and Behavior Lesson includes an activity called “Beak Business” that simulates how birds’ beaks are adapted to their environments. The PowerPoint presentation in this lesson discusses adaptations of animals due to changes in their environments.

Requirement 1.: Explain why physical exams are important.

Physical Exam Module: Interaction of Systems through Signalment and Medical History Lesson contains a PowerPoint that goes over the importance of a physical exam in pets and has applications for people as well.



PERSONAL FITNESS

DOG CARE



Requirement 5.: Explain the correct way to obedience train a dog and what equipment you would need.

Behavior Module: Veterinary PowerPoint on Behavior includes dog training.

Requirement 7h.: Briefly discuss the signs and symptoms and method of prevention of rabies, parvovirus, distemper, and heartworms in dogs.

Vaccination/Infectious Diseases Module: Interactions of Systems through Rabies Lesson contains an informative PowerPoint about rabies.

Structure and Function of the Heart and Circulatory System Module: contains an informative veterinary student video on heartworm disease.

Requirement 4c.: Train a pet in three or more tricks or special abilities.

Behavior Module: Veterinary PowerPoint on Behavior includes dog training.



PETS

The Perks of Pet Ownership

Researching Companion Animals with Dean Green

Katie Clark

When deciding whether or not to get a pet, what would you consider?

You might consider that pets can be very special members of a family that bring joy, laughter, and companionship; or that they are a huge responsibility that require time, attention, and money.

Several great considerations were made by middle school students in this year's Drawing and Essay Contest on the responsibilities of pet ownership.

Each year, the PEER program and the Texas A&M University Chapter of Sigma Xi hold a contest in which middle school students are encouraged to express their creativity through a drawing and essay contest.

The contest is often related to one of the lecture topics of the Texas A&M University Distinguished Lecture Series. This year's contest, however, was in association with a very special lecture presented by the Dean of the Texas A&M College of Veterinary Medicine and Biomedical Sciences, Dr. Eleanor Green.

Dr. Green's lecture topic was "Companion Animals." Discussing animals in society, Dr. Green touched on history, current statistics, societal changes, and the impacts of the human-animal bond.

Middle school students from around the state of Texas entered the contest in hopes of winning a dinner with their family and teacher and a

token of appreciation and congratulations from the University.

All student essay and drawing entries were showcased at the 2011

PEER provided students with a list of websites for their research on the advantages and disadvantages of pet ownership.

This year's contest was a great success with an amazing 835 entries, including students from 53 different schools across Texas. There were a remarkable 416 drawing entries and 419 essay entries. Drawings and essays were evaluated by the undergraduate Fellows of the PEER program.

Contest sponsors were thrilled to have such enthusiastic participation, and appreciated all of the hard work and effort each student put into creating his or her essay or drawing. ■



Winning drawing from a 7th grader featuring a very "pampered pet."

Texas A&M University Sigma Xi Banquet, and many of the entries were even referenced in Dr. Green's lecture.

Sigma Xi, the Research Society, sponsored the contest, and PEER coordinated the judging and contest submissions.

This year, students were asked to do research on pet ownership. Students had the opportunity to enter a drawing contest, an essay contest, or both.

For the drawing contest, students were asked to use their imagination and the information they obtained from their research on pet ownership to illustrate a relationship between a pet and its owner.

For the essay contest, students were asked to write a story that would assist someone who is considering getting a pet for the first time in making their decision.



All student drawing and essay entries were showcased at the 2011 Texas A&M University Sigma Xi Banquet.



Dr. Larry Johnson presents a certificate of excellence to a 7th grade drawing winner.

Aggie Day

Katie Clark

Every two years, the Rio Grande Region of the United States Pony Club (USPC), one of the leading junior equestrian organizations in the world, canters into the Texas A&M University College of Veterinary Medicine & Biomedical Sciences to participate in Aggie Day. During the event, pony clubbers hone their knowledge of equine veterinary skills to advance their ranks and meet the knowledge standards required by the USPC.

The Pony Club members are given an exciting opportunity to take tours with veterinary technicians in and around the Large Animal Teaching Hospital. These tours cover a wide range of animal health fields including radiology, ultrasound, general exams and field services, reproduction, teeth, and an exterior excursion of the clinic. This year, in the reproduction and ultrasound rooms, veterinary technicians Sheila Teague and Heather Quiram demonstrated to pony clubbers how technology is used in the diagnosis and treatment of horses.

“My favorite part of my job,” explains Sheila Teague, “is working with the animals and helping the students learn to be able to correct some of the problems horses have when they’re being bred.”

Other veterinary technicians in attendance at the event were Sandy Nunn, Jessie Mundy, Candise McKay and Donna Witt. They were especially

“Pony clubbers are enthusiastic about their possible future in veterinary medicine, and veterinary technicians and students helped to light that fire.” Dr. Larry Johnson

stimulating to the Pony Club students and parents in their effort to promote the CVM hospital and its capabilities. In helping with Aggie Day, these technicians not only interacted with



Veterinary technician, Candise McKay, teaches pony clubbers about routine veterinary care.



Veterinary technician, Heather Quiram teaches about the power of ultra sound technology.



Pony clubbers interact with live horses and enjoy learning how to take vital signs.

youth and provided content about various equine veterinary skills, but they also promoted careers as a veterinarian or veterinary technician, increased knowledge about available procedures, promoted pet ownership responsibility, and increased awareness about veterinary scheduling.

In addition, there were lectures on nutrition and feeding. Aggie Day also features 25 other stations set up throughout the vet school that help members meet the USPC knowledge standards for various rating levels

of pony clubbers. Stations cover everything from learning about breeds, colors, and markings to immunization, deworming, and measuring horse vital signs were presented by

veterinary and graduate students. Students also learn how to correctly nail a shoe on a horse’s foot in a safe and interesting setting.

Other stations allow the pony clubbers to work with live horses to determine body condition scoring and weight estimation. Participants also have the opportunity to go over toxic plants, nutrition, and grains to help those who assist in feeding their own horses.

Aggie Day ended with information on entry into college and the veterinary school with a panel of veterinary students from each of four years telling about their passions, pets, and paths taken to enter veterinary school.

Aggie Day provides pony clubbers with many hands-on experiences, creating a unique learning environment that they normally would not have. ■

Veterinary School Open House

Kristen Turner, Executive Director

Cecilia Montes & Erin Braley, Publicity Co-Chairs

Since 1994, veterinary students of the Texas A&M University College of Veterinary Medicine & Biomedical Sciences (CVM) have held an Open House in which the public is invited to explore, experience, and discover the dynamic roles of veterinarians and animals in our society. As Texas A&M is home to the only veterinary medical school in Texas, this is a wonderful opportunity for people of all ages to go behind the scenes and experience veterinary medicine in action!

The 18th annual Vet School Open House was held Saturday, April 9, 2011. The vet school opened its doors to over 10,000 visitors! Events included tours of the large and small animal teaching hospital, numerous exhibits and hands-on



Students and parents are shown a hydraulic chute used for rotating and holding animals securely during foot procedures.



Students gain interest in research and discovery when examining images of microscopic anatomy.

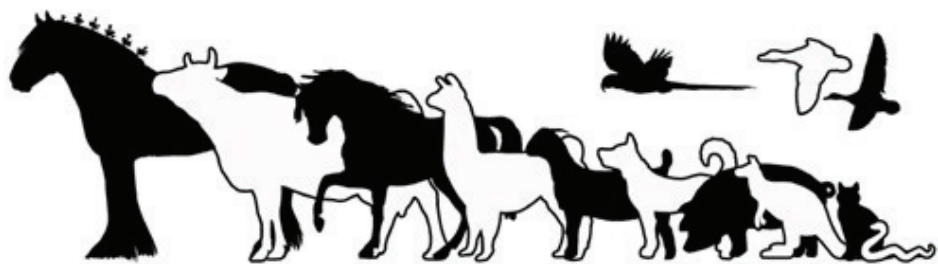
activities, and exciting demonstrations by local organizations and animal interest groups. This year, Open House featured “Zoomagination” live animal encounters, search and rescue dog demonstrations, horse and dog breeds exhibits, pictures with Reveille and live spay and neuter surgeries. Presentations about many different aspects of veterinary medicine and animal husbandry were given throughout the day, with topics such as ‘A day in the life of an emergency vet’ and ‘Good Paws’ training and behavior.

This unique event provides a one-of-a-kind learning experience for visitors. One of the most anticipated events of the day was Teddy Bear Surgery where kids (and kids at heart) were given the opportunity to ‘gown up’ for surgery on their favorite stuffed animal. For aspiring veterinarians, Q&A sessions with admissions committee members and current veterinary students pro-

vided two very different perspectives on how to prepare for and do well in veterinary school.

In addition to providing an entertaining and educational experience for the general public, Open House presents veterinary students with a wonderful opportunity to become involved with the community and interact with people of all ages and backgrounds. As a completely student-coordinated event, Open House is a joint effort among many veterinary students to provide to visitors from across the state a fun, educational look at our wonderful school.

Plans are already being made for future annual Vet School Open Houses! For more information, visit our website at <http://vetmed.tamu.edu/openhouse> or ‘like’ us on Facebook. We hope to see you there! ■



Undergraduate Involvement

Joseph Hicks

The Texas A&M University Veterinary School Open House provides a great way for the community to learn about the college, veterinary medicine, and, really, science in general. But by “community,” I do not only mean boy and girl scouts and their parents. Undergraduate students, too, can get a lot out of participating and volunteering at Open House.

For those who want to go to vet school, it is an opportunity to get acquainted with the college, meet faculty and students, and express a passion for both animals and medicine. As an undergrad longing to get into vet school, I jumped at the opportunity to volunteer at Open House because it allowed me to get closer to my dream. I got to see parts of the building I had never seen, learn new things about parasites and anatomy, and meet people who shared my interests. Every year, I looked forward to volunteering at Open House because just for a day, I could pretend I was already a vet student.

Going to vet school is not everyone’s dream, though. Even if veterinary medicine was never on your career plan, there are still many benefits to volunteering at Open House. For the students who plan a life in human medi-

cine, Open House is an exciting opportunity to see the other side of the same coin. Although it is being practiced on animals, veterinary medicine is still medicine. The similarities between the two fields can be pretty enlightening. For all science majors, Open House provides a chance to practice communicating scientific information to a general audience. But really, the benefits of volunteering at Open House are very similar to volunteering at any event and apply to any student, from those in political science to education. Some of the skills practiced include communicating with children and adults, logistics, organization, accounting, and conflict management.

The greatest benefit, though, is the ability to help with an event that is completely student planned, organized and executed. Without undergraduate volunteers, Open House could not be a success. And because everyone is a student, all volunteers are given the opportunity for leadership. That is actually what impresses visitors most when they attend the Texas A&M Vet School Open House: the ability of a group of student leaders to run such a large, complex, and successful event. ■



A veterinary student discusses with a group of Girl Scouts the importance of veterinary care for small animals.

Open House Collaborations

“Not only is the Texas A&M University College of Veterinary Medicine the only vet school in Texas, it is also one of the nation’s top veterinary schools. We are so fortunate to have the opportunity to share our school and our experiences as students with our community.

Open House would not be possible without the help of the faculty and staff of the Texas A&M College of Veterinary Medicine. Though the event is primarily planned by students, the veterinarians and veterinary technicians of the school participate throughout the entire process and, on the day of the event, to ensure its success. This school’s commitment to giving back to the community is reflected in the encouragement and tireless effort of these men and women to make Open House a fun and valuable experience for everyone.”

– Erin Braley



COLLEGE KNOWLEDGE

Tips for High School Students Interested in Attending College

To prepare for college-level professional courses, students should complete a college preparatory curriculum that includes...

At least one year of each...

Physics

Biology

Chemistry

At least...

1 1/2 years of Algebra

1 year of Geometry

1/2 year Trigonometry

Also...

English (writing and literature)

Social Sciences

History

and any other subjects required by your high school and by the college(s) you plan to attend.

College-level students are expected to learn course material on their own outside of the classroom. Developing strong academic skills and study habits while you are in high school will help you make a successful transition into college studies.



Extracurricular

Brittany Sanchez

Colleges want to know about your life both inside and outside the classroom. Extracurricular activities demonstrate your interests and that you are able to:

- Make a meaningful contribution to something
- Maintain a long-term commitment
- Manage your time and priorities



Not involved yet? There are lots of opportunities to try different things.

School Activities

You can easily find out about activities available at school by going to the office. The challenge may be figuring out what and how much to do.

Here are some tips:



- Find something you like to do and stick with it.
- Don't worry about being president of the club or captain of the team. The key is whether you've done something significant.
- Give your all to each activity, but make sure there is time for your schoolwork.



Work Experience

Work experience can help you find career interests, set goals, gain experience, and apply classroom learning to the real world. You can also save money for college.

Community Service

You can also gain skills and experience through volunteer work. Some opportunities include tutoring younger students or volunteering at a local hospital. Working in your community can help you develop good leadership and communication skills.



Becoming a Veterinarian

Your high school years are an excellent time to start considering what you'll have to do to gain entrance to veterinary school.

Minimum Required Coursework in High School

- 4 years of English
- 4 years of Mathematics
- 4 years of Science
- 2 years of the same foreign language



While veterinary school admission offices do not review high school grades, high GPA (grade point average) and SAT scores pave the way for entrance to more prestigious schools.

Most veterinary schools require four years of undergraduate education before they will accept your application. It is recommended that you choose a science-related major like biomedical science, biochemistry, biology, or animal science.



The most common requirements include: very specific science coursework, a minimum GPA and the GRE (Graduate Record Examination).

Work experience is also a plus for getting into veterinary school. Work for a veterinarian, with animals at a zoo, farm, pet store, preserve, state park or stable, or in a science- or medicine-related field.



SCIENCE AND CAREERS IN SCIENCE



Brittany Sanchez

For more information visit <http://peer.tamu.edu/Interviews/ScienceAndCareers/ScienceAndCareersInScience.html>



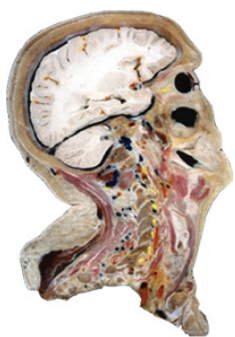
To access the **Careers in Science** booklet, search for “Careers” at http://peer.tamu.edu/DLC/NSF_Resources.asp

What is Science?

Science (from the Latin *scientia*, meaning “knowledge” or “to know”) is the effort to **discover** and increase **human** understanding of how the physical world works.

Through **controlled methods**, scientists use **observable physical evidence** of natural phenomena to collect informational data and analyze this information to explain what and **how things work**.

How has the word Science been used?



- knowledge
- **cut, separate, discern, he cuts off, I split**
- the same sort of very broad meaning like **philosophy** (love of knowledge)
- science = philosophy in other languages
- **Ph.D. = doctor of philosophy** (doctor of the love of knowledge)

The Scientific Method

The **scientific method** seeks to explain the events of nature in a **reproducible** way to make useful **predictions**.

Words used by scientists include: model, **hypothesis**, experimental design, peer review, scientific theory, scientific ethics, facts, and **physical law** or law of nature.

Fields of Science

Fields of science are of two major lines:

- **natural sciences**, which study natural phenomena (including biological life),
- **social sciences**, which study human behavior and societies.

Natural sciences include engineering, medicine, and veterinary medicine.

These empirical sciences have knowledge based on observable phenomena and are capable of being experimentally tested for validity.



Careers in Natural Science



Biology

- Anatomy
- Astrobiology
- Biochemistry
- Bioinformatics
- Biophysics
- Botany
- Cell biology
- Developmental biology
- Ecology
- Entomology
- Epidemiology
- Evolutionary biology
- Freshwater Biology
- Genetics
- Immunology
- Marine biology
- Microbiology
- Molecular Biology
- Morphology
- Neuroscience
- Physical anthropology
- Physiology
- Population dynamics
- Structural biology
- Taxonomy
- Toxicology
- Virology
- Zoology



Chemistry

- Analytical chemistry
- Biochemistry
- Computational chemistry
- Electrochemistry
- Inorganic chemistry
- Materials science
- Organic chemistry
- Polymer chemistry
- Physical chemistry
- Quantum chemistry
- Spectroscopy
- Stereochemistry
- Thermochemistry

Physics

- Acoustics
- Astrodynamics
- Astronomy
- Astrophysics
- Biophysics
- Classical mechanics
- Computational physics
- Condensed matter physics
- Cryogenics
- Dynamics



- Fluid dynamics
- High Energy physics
- Materials physics
- Mechanics
- Nuclear physics
- Optics
- Particle physics
- Plasma physics
- Polymer physics
- Quantum mechanics
- Solid State physics
- Thermodynamics

Earth Science

- Environmental Science
- Geodesy
- Geography
- Geology
- Hydrology
- Meteorology
- Oceanography
- Paleontology
- Seismology



Social Media Connections

Sherry Rosedahl

With the increasing presence of Web 2.0 technologies (i.e., blogs, Twitter, podcasts, wikis, social network sites, virtual worlds, video and photo sharing), PEER is establishing a social media presence.

We have created a Facebook page to interact with science and agricultural science teachers and other science professionals. Our Facebook page allows PEER-created materials to be disseminated to a worldwide audience.

One goal of the PEER Facebook page is to provide teachers with current science topics to discuss with their students. We post links to the Texas A&M College of Veterinary Medicine and Biomedical Sciences and science-related content.

The professional veterinary degree curriculum is a four-year program composed of three years of classroom study with a final year of clinical rotations. The fourth-year curriculum consists of 30 weeks of basic core rotations, 12 weeks of elective clinical rotations or career alternative electives, 4 weeks of externship and 2 weeks of vacation for 46 credit hours. The fourth-year curriculum allows students to choose a species-directed career (i.e., large animal, small animal, mixed animal) or to take an alternative career elective.

Several fourth-year veterinary students will be posting updates to the PEER Facebook page related to their diverse activities during their final year of veterinary school. This will allow teachers and students a unique view of the veterinary student training experience showcasing the diversity of science careers available.

Another goal of the PEER Facebook page is to connect with the teachers who attend our summer workshops and continue to extend that interaction throughout the school year.

To foster ongoing communication, collaboration, and content-sharing of PEER materials, we created a Facebook group for the 2011 Summer Workshop attendees. A Facebook group provides a closed space for small groups of people to communicate about shared interests.

There are three types of Facebook groups: secret, closed, and open (public). The PEER Summer '11 Workshop group is a closed group; meaning that while everyone can see the group only members see the posts. The name of the group and its members are still visible to everyone so people who want to request membership in the group can find the right group.

In Facebook groups, members receive notifications by default when any member posts in the group. Group members can participate in discussions, poll other members, upload photos to shared albums, collaborate on group documents, and invite all members to group events. This group provides a forum for teachers to assist one another in using the Veterinarians' Black Bag (VBB) and other PEER educational materials.

Another form of social media used by PEER is Social Bookmarking. This is a method to organize, store, manage, search, and share links to useful websites and resources online. PEER created a free account with a social bookmarking ser-



vice, Delicious (<http://www.delicious.com/TAMU.PEER>), to share resources and information with teachers. When a resource is bookmarked, the creator of the bookmark assigns the resource a tag to categorize it. The tag allows other users to search for a particular type of resource. Users can create networks with other users.

PEER also has a YouTube account (<http://www.youtube.com/peer-tamu>) for sharing video interviews and presentations from vet and graduate students, veterinarians, veterinary technicians, and scientists. We are able to collaborate with other Texas A&M University organizations that have YouTube accounts by subscribing to their pages.

By sharing valuable information through various social media connections, we can serve as a resource to our online community. Social media is being used by the PEER program to make it easy and convenient for educators to follow advances, news, and strategies in science education. ■



VET PROFESSIONALS

PART II

Francisco Alvarez

Cisco has a 'can do' attitude no matter what tasks need to be done. With his work ethic, efficiency, positive attitude, and excellent technical skills, he gets tasks done with minimal or no stress. People (students, interns, residents) who assist Cisco invariably enjoy doing so. Cisco knows all of the students, technicians, barn crew, and housekeeping crew. Cisco is very friendly when doing his job, passing people with a friendly exchange of words. He definitely brings something very special to the Veterinary Medical Teaching Hospital.



Veterinary Technician Employees of the Month

The Employee of the Month award recognizes the outstanding efforts of staff and the contributions they make to the success of the Texas A&M College of Veterinary Medicine and Biomedical Sciences. Here are a few dedicated and hard-working veterinary technicians who have received this award. The list of recent veterinary technician EOMs continues on page 28.



Danna Lewis

Dannie is an outstanding technician who truly grasps the complexities of the operating room, on an equipment level and an asepsis level and as a great communicator and teacher. Her perspective is 'what is best for the patient' regardless of the impact that it might have on her personal time. In addition to troubleshooting several major problems in the OR and preventing patient harm in the last year, Dannie has set a tremendous example for other employees. In particular, when Dannie works a case, she is involved and engaged, always anticipating the surgeons' needs and doing whatever she can to minimize operating time and prevent post-operative infection. Dannie is passionate about animals, about patient care, and about making our operating room the best it can be.

Linda Knight

Linda contributes greatly to the success of the day-to-day operations of the Small Animal Radiology section. She organizes the daily caseload for radiology and small animal ultrasound. She can work in any area of the small animal radiology section with ease. Linda works closely with students, clinicians, and peers to get the job done. She is a key player in regard to training new employees into the section because she is a role model for responsibility and dedication. All of the radiologists appreciate her hard work and her contributions to the section. Her enthusiasm and dedication is very much appreciated.



Thomas Koenig

Tommy has 23 years of successful veterinary experience working for the Fayette County Veterinary Clinic in La Grange and at the Highway 620 Animal Hospital and Dental Clinic in Austin. Koenig is a Charter member of the Academy of Veterinary Dental Technicians (AVDT) and presently serves on its Exam and Education Committees as he is a leader in his field. He has also achieved specialty status for veterinary technicians in dentistry. In his free time, Koenig enjoys fishing and taking care of his dog, cat, and donkey.

**FEBRUARY
2010**



Dana Whitaker

Dana is the Small Animal Soft Tissue Surgery Technician. After working for 15 years in retail and automotive finance and feeling unhappy by that career path, she decided to go back to school for her degree in Veterinary Technology. Immediately after graduating in 2005 from Bel-Rea Institute of Animal Technology, she began her career at Texas A&M College of Veterinary Medicine in the Anesthesia Department. In her current position in SA Soft Tissue Surgery, Dana routinely assists in surgical procedures and wound management. She also teaches 3rd and 4th year veterinary students and international students about bandaging.

Cassandra Hindsley

Cassie is a Small Animal Operating Room Technician. She deserves recognition for her extraordinary performance of her expected duties and her uncanny ability to anticipate and respond to other areas. Providing surgical scrub assistance is a demanding and very cerebral job. Good situational awareness; knowledge of procedures, instruments, and surgeons' preferences; and the ability to anticipate the next need are the hallmarks of the very best scrub assistants. To have all these qualities in one individual is extremely rare.



**APRIL
2011**



Michelle Kerr-Pankonien

Michelle is a Small Animal Hospital Technician who takes care of the DMRO and ISO wards. But she also does so much more; she assists in all services that need help. Michelle takes on any task given to her with a smile. She also takes a lot of pride in her work and will not leave a job unfinished as she is very dedicated and hard-working. When she does a job you know that it is done right!

Ms. Teague works tirelessly to assist our Section [Large Animal Therio] with varied needs, and is a most dependable and attentive individual. In the teaching arena, the professional and graduate students rave about her dedication to the teaching program. Her nurturing and interpersonal skills, superb laboratory skills, and strong horse-handling background make her a splendid mentor for the students. Ms. Teague also strives to assist faculty members in all ways possible and never gives up when an apparent impasse is encountered in the clinic. Ms. Teague is an extraordinary technician with a level of morality above reproach. She interacts extremely well with students, house officers, and faculty, is very resourceful, and always has a 'can do' attitude.

**JANUARY
2009**



Jean Laird

Jean is the Canine Internal Medicine and Endoscopy technician at the Vet School. Jean has 15 years experience in veterinary medicine including small and large animal, practice management, research, surgery specialty, emergency medicine and animal cruelty investigations. She writes the manuals and protocols for both Internal Medicine and Endoscopy and trains Residents and fourth year students in Endoscopy. She enjoys teaching and lecturing as well as volunteering for school events such as Open House, the Houston Livestock Show and Rodeo, student orientations, and specialized labs.

Sheila Teague



Small Animal Clinic Technicians Honored

Several small animal clinic veterinary technicians from the Texas A&M College of Veterinary Medicine & Biomedical Sciences were recognized as part of National Veterinary Technician Week. Fourth year veterinary students voted for veterinary technicians in a number of categories and the winners were recognized at an awards ceremony. Twelve awards were received by nine different technicians and support staff.

- Best All Around Medicine Technician - Jean Laird**
- Best All Around Anesthesia Technician - Kate Maki**
- Best All Around ICU/Triage Technician - Lori Carpenter**
- Best All Around Radiology Technician - Hollye Callis**
- Best All Around Surgery Technician - Wendy Greathouse**
- Best All Around Operating Room Technician - Cassie Hindsley**
- Best Teacher - Jean Laird**
- Most Helpful - Jean Laird**
- Best Patient Advocate - Liz Kelley**
- Most Service Oriented - Kay Waddell**
- Best Non-Clinical Support Staff - Dennis Hargett**
- Best Support Service Technician - Josh Freeman**



Dean Green and Jason Ferrell present certificates to Jean Laird.

Dr. Eleanor M. Green, Dean of Veterinary Medicine, was in full support at the event recalling that she is a “technician at heart.” Jason Ferrell, a fourth year veterinary student and the vice president for the fourth year student body, was also on hand to present the awards. ■

From the Dean

“Throughout the years, I always knew that my success stemmed from the support of the (veterinary) technicians. I cannot imagine our program without the help and service they show our veterinary students and the patients of the hospitals on a daily basis. I have always been well aware of the impact they have throughout this program and I am very grateful for each and every one of them.” – Dr. Eleanor M. Green, Dean

From the Department Head

“Veterinary technicians are invaluable resources of the Veterinary Medical Teaching Hospital at Texas A&M. They support our specialty veterinarians and our residents and interns in their training programs. Our technicians' contributions span all aspects of diagnostics, treatment, and patient care; they are essential in our teaching and clinical research programs. Our technicians care for their patients diligently and compassionately and their clinical competence is vital to the training of our veterinary students as they learn and practice their technical veterinary skills.” – Dr. Sandee M. Hartsfield, Department Head of Small Animal Clinical Sciences

From the Veterinarian

“Our veterinary technicians are truly ‘mission critical’ in helping us serve the state of Texas both by providing outstanding clinical service and also by producing well-trained, caring veterinarians who will go out and provide great service to the state of Texas and beyond.” – Dr. Sharon Kerwin

Invaluable Veterinary Assistance

Betsy McCauley

The veterinary assistant/technician is an essential person in any veterinary practice.

There are many different areas of veterinary medicine in which a veterinary assistant or technician can specialize. The veterinary practice is not limited to just a clinical business. Today many veterinary hospitals specialize in every aspect of animal health care. Medicine and Surgery, Radiology and Ultrasound, Cardiology, Oncology and Therapy are just a few specialties. The veterinary hospitals of today may

also feature different types of specialized animal care including Small Animal, Large Animal, Equine and Farm animal medicine. Exotic, Zoological, and Marine animals are very specialized fields of veterinary medicine, and they require veterinary assistants or technologists to care for and treat these animal.

The veterinary assistant or technologist assists the veterinarian when evaluating the animal's condition and cares for the animal when it is in the hospital. Feeding, grooming and ob-

HAVE YOU  HUGGED A VETERINARY TECHNICIAN TODAY?

serving the animals are very important duties of every assistant.

Knowing when an animal is sick or injured and relaying this information to the veterinarian truly helps with animal care. Running lab work and imaging animals are advanced areas of veterinary medicine, and are very important duties. As you advance and learn more, you become more invaluable to every practice. ■

Veterinary Technicians Influence Undergraduates

Beverly Crocker



Beverly Crocker with veterinary technicians, C.W. Haynes and Melissa Welch.

Undergraduate students interested in pursuing the field of veterinary medicine at Texas A&M University or at any campus, are generally told to gain experience by volunteering in a veterinary clinic. This volunteerism is called shadowing the veterinarian and it gives students a unique “behind the scenes” opportunity to experience veterinary medicine and further their knowledge of the profession.

As an undergraduate student, I was informed that shadowing was a requirement for admission to veterinary school. Fortunately, I was a member

of the Texas A&M University Pre-Vet Society which offers a Shadow Program. The Shadow Program matches students to a veterinary practice in their area of interest over summer and winter breaks from school.

I was assigned to the Food Animal Clinic at Texas A&M University over the summer break. On my first day, I walked in and was amazed by the size of the hospital, the vet students, and the clinicians who were coming to the clinic. Just as I began to feel slightly overwhelmed by my surroundings, Melissa Welch, one of the veterinary

technicians, introduced herself to me.

Melissa gave me a quick tour around the Food Animal Ward and then introduced me to another veterinary technician, C.W. Haynes. They both were extremely friendly and as the day went on, they were the ones who answered any and all questions that I had about preparations or procedures. They both allowed me to help them whenever I could and introduced me to the rest of the staff.

From that day onward, even when all the clinicians and students were occupied with a task, I could always turn to Melissa or C.W. to answer any of my questions. Everyone in the Food Animal Ward was extremely friendly, and the teaching environment they created was very encouraging and innovative to student learning.

This year, as I transition into my first year of veterinary school, I will always remember my experiences in the Food Animal Clinic and will never forget the two veterinary technicians that were so kind and helpful on my first day! ■

Blinn College Vet Tech Program

Dr. Melanie Landis



Veterinary technicians assist veterinarians in clinical settings and vet students in educational settings. Shown here, a vet student performs a dental procedure on a horse.

With a degree in veterinary technology, you can combine your love and compassion for animals with an exciting career as a veterinary technician.

For years, Blinn College and the College of Veterinary Medicine at Texas A&M University had discussed collaborating on a veterinary technology program. However, it was not until December 2009 that the details were finally ironed out and a memorandum of agreement signed between the two schools.

The Veterinary Technology Program is a two-year program offered through Blinn College that leads to an Associate of Applied Science Degree in Veterinary Technology.

Students spend most of the first year of the program on the Blinn-Bryan campus taking foundational courses in many of the basic veterinary sciences such as Anatomy & Physiology, Parasitology, and Pharmacology. Much of the second year of the program is conducted at

the TAMU College of Veterinary Medicine where students participate in many clinical laboratories and complete the program by performing clinical rotations within the Large and Small Animal Teaching Hospitals.

The Veterinary Technology Program has a competitive admissions process that admits new classes only in the fall semester. Students who successfully complete the curriculum may sit for national (VTNE) and state (Texas RVT examination) credentialing examinations. Passage of these exams will confer the status of Registered Veterinary Technician (RVT) in the state of Texas.

Veterinary technology students are prepared with knowledge and skills to work in a number of animal health fields. While most RVT's are employed in private veterinary practices, other employment opportunities include animal shelters, stables or reproductive facilities, zoos or wildlife facilities, pharmaceuti-

cal sales, the military, and homeland security.

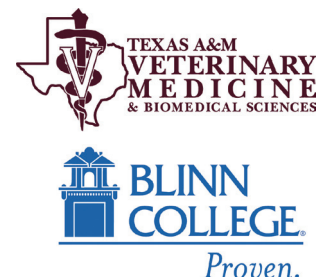
While the goal of most RVT's is to promote animal health, some contribute to human health as well through biomedical research activities by working in laboratory facilities where they assist veterinarians and other scientists in medically-related fields such as gene therapy, cancer research, and cloning.

Applications for the Veterinary Technology Program are accepted each year between April 1 and May 31. An application packet is acquired by attending one of many information sessions hosted throughout the year. The information sessions provide further information about the program and allow faculty to discuss with prospective students the various documents that comprise the application packet.

An RVT program provides knowledge and understanding as well as basic skills necessary to assist a veterinarian in practice, which will allow a person to "trouble shoot" or critically analyze and adjust their actions to meet changing situational needs.

Veterinary technicians and veterinarians work together to provide quality care and promote animal health.

For more information about the Blinn College Veterinary Technology Program, visit the program website at www.blinn.edu/twe/vet_tech. ■



Curriculum (72 credit hours)*

Prerequisite Semester:

BIOL 1406 - General Biology I
CHEM 1411 - General Chemistry I
MATH 1314 or 1324 - College Algebra or Math Analysis I
ENGL 1301 - Composition and Rhetoric

Year 1 - 1st Semester

VTHT 1401 - Introduction to Veterinary Technology
VTHT 1205 - Veterinary Medical Terminology
VTHT 1209 - Veterinary Nutrition
BIOL 2421 - Microbiology

2nd Semester

VTHT 1413 - Veterinary Anatomy and Physiology
VTHT 1225 - Pharmacological Calculations
ANY SOCIAL/BEHAVIORAL SCIENCE ELECTIVE
ANY HUMANITIES OR FINE ARTS ELECTIVE

3rd Semester

VTHT 2421 - Veterinary Parasitology
VTHT 1160 - Clinical – Veterinary/Animal Health
Technology/Technician and Veterinary Assistant

Year 2 - 1st Semester

VTHT 2323 - Veterinary Clinical Pathology I
VTHT 2217 - Exotic Animal Clinical Management
VTHT 2209 - Food Animal Clinical Management
VTHT 2205 - Equine Clinical Management
VTHT 2201 - Canine and Feline Clinical Management
VTHT 1349 - Veterinary Pharmacology

2nd Semester

VTHT 1441 - Anesthesia and Surgical Assistance
VTHT 2431 - Veterinary Clinical Pathology II
VTHT 1345 - Veterinary Radiology
VTHT 2360 - Clinical - Veterinary/Animal Health
Technology/Technician and Veterinary Assistant

3rd Semester

VTHT 1140 - Veterinary Jurisprudence and Ethics

* Veterinary technology courses are not transferable to 4-year institutions.

Admission

Students must be accepted into the program before taking Veterinary Technology courses. All courses required within the listed curriculum must be passed with a “C” or better in order to progress to the next semester’s courses.

Applications are accepted each year between April 1 and May 31. An application packet is acquired by attending one of many information sessions hosted throughout the year, which provide further information about the program. Persons interested in the Veterinary Technology Program are encouraged to visit the Program’s website (www.blinn.edu/twe/vet_tech) to learn more about the program and to sign up for one of the informational sessions. Prior to submitting an application packet, prospective students must meet several application criteria. First, all potential applicants must meet Texas Success Initiative (TSI) guidelines. Second, all required prerequisite courses must be completed with a “B” or better prior to application submission. Additionally, the science and math courses must have been completed within the last 10 years. Third, all applicants must take and pass the Health Occupations Basic Entrance Test (HOBET) with a score above 70%. Finally, all applicants must obtain a minimum of 40 hours of veterinary supervised clinical experience.

Applicants accepted into the Veterinary Technology Program must attend a mandatory orientation prior to the start of the fall semester.



Veterinary technicians assist vet students with their wet lab finals.

Pathway to Becoming a Vet Tech

Brittany Sanchez

Betsy McCauley grew up in a military family traveling all over the world. During that time, she discovered her love for animals and her new found desire to one day work for a veterinarian.

As a start, Betsy began working with breeders and groomers where she learned animal care and responsibility. She eventually started working in a veterinary practice. There she learned that, as a veterinary assistant, she was the extra eyes, ears, and hands for the veterinarian. She found this to be very rewarding.

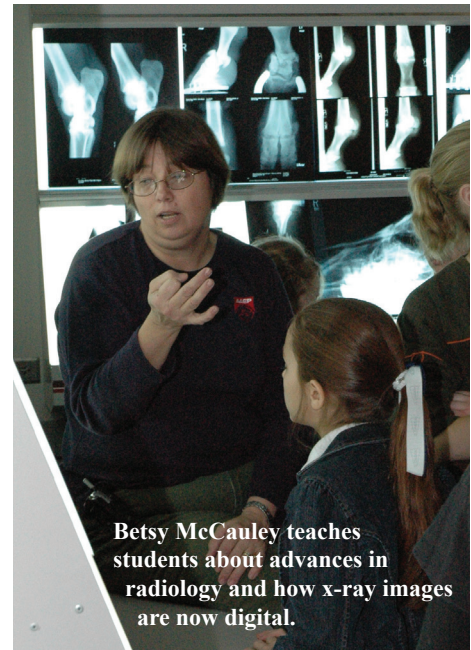
Betsy then decided to attend Sul Ross State University in Alpine, Texas where she enrolled in the Veterinary Assistant's program, which is equivalent to Veterinary Technology education programs today. She could choose to either attend for two years or four years. Betsy elected to attend for four years and specialized in range animal medicine, through which she learned about exotic, wild, and domestic animals.

Upon completing her education,

Betsy learned how important her position is when working with a veterinarian. As a veterinary technician, Betsy serves as the go-between for the owner, the animal, and the veterinarian working to alleviate concerns and improve the health of the animal.

Although there are several specialty areas in which technicians can work like anesthesia, surgery, and physical therapy, Betsy became interested in radiology early in her career. Betsy received her associate's degree in radiology at Austin Community College. She then started working in the Radiology Department at Texas A&M College of Veterinary Medicine where she has happily remained for just over twenty years.

Today Betsy works with large and small animals using numerous imaging modalities including x-rays, ultrasound, CT, MRI, nuclear medicine, and radiation therapy. In radiology, says Betsy, "the images can sometimes state what the animal cannot say." Those images collected are now digital and can be stored and



Betsy McCauley teaches students about advances in radiology and how x-ray images are now digital.

sent across the nation and the world for diagnosing and treating animals.

When asked what she finds to be the most rewarding part of her job, Betsy says, "I truly treat and respect the animals, get them to trust me, so that I can represent their problems and help their owner and the veterinarian make the best decisions for that animal." ■

Veterinary Technician Employees of the Month (Continued from Page 22)

2011	January	Carlotta Ansourian	Large Animal Internal Medicine
2011	February	Hollye Callis	Small Animal Radiology
2011	March	Janie Weger	Large Animal Surgery
2011	April	Michelle Kerr-Pankonien	Small Animal Hospital
2010	April	Jennifer Sheldon	Small Animal Emergency Room
2010	July	Aimee Day	Small Animal ICU
2009	April	Jessica Butcher	Animal Intensive Care Unit
2009	October	Tina Brunnet	Anesthesia
2008	August	Julie Harris	Small Animal Surgery
2007	January	Liz Kelley	Small Animal Feline Internal Medicine
2007	March	Brent Matthys	Small Animal Surgery
2007	July	Krystal Schneider	Small Animal Oncology
2007	August	Sabra Johnson	Large Animal Equine Lameness
2007	November	Greg Bramson	Large Animal Intensive Care Unit
2007	December	Katy Waddell	Small Animal Cardiology

Continuing Education

Kristin Burlingame



Veterinarians and veterinary technicians register for Continuing Education.

The primary mission and goal of the Continuing Education (CE) Office at the Texas A&M College of Veterinary Medicine & Biomedical Sciences is to provide quality continuing education for veterinarians, veterinary technicians, and various animal-producer groups.

The CE Office has many opportunities available for veterinary technicians to further their education. The annual Veterinary Technician conference offers two days of lectures and hands-on labs specifically for technicians. Attendees can pick from a wide variety of topics, including exotics, anesthesiology, nutrition, pain management, and many other current topics in small and large animal medicine. Participants receive outstanding instruction from the College's own veterinarians and veterinary technicians.

The Continuing Education Office also offers conferences on specific subjects that are available to technicians, such as the annual Feline Symposium and the annual Canine Paramedicine Conference. These,

like the annual Veterinary Technician conference, are generally held on weekends. This allows technicians to obtain the ten hours of CE credit required for RVT license renewal or the five hours required for CVM license renewal. A complete schedule of upcoming conferences can be seen on the Texas A&M College of Veterinary Medicine & Biomedical Sciences' webpage, <http://vetmed.tamu.edu/ce>. ■

"The value of Continuing Education is beyond measure. Continuing Education is the perfect way for all employees of any veterinary practice to learn and remain current in the always-changing field of Veterinary Medicine. From veterinary assistants and office managers to technicians, CE is an invaluable tool. Of course, the state of Texas requires a minimum of 10 CE hours per year for Registered Veterinary Technicians to maintain their registration.

The Texas A&M College of Veterinary Medicine hosts an annual Veterinary Technician Conference. The conference committee works hard to provide what past attendees have requested. The goal is to provide something for everyone."

— Dana Whitaker



Continuing Education staff assist a veterinarian with registration.



LESSON PLANS

PART III

Objectives

1. Scientific inquiry and investigations
2. Critical thinking and problem solving
3. Tools of scientific inquiry, safety equipment
4. Understand organisms are made of cells, classify as prokaryotic or eukaryotic, and recognize classification into domains and kingdoms
5. Identify biotic and abiotic parts of an ecosystem in which an organisms interacts
6. Investigate how internal structures of organisms have adaptations that allow specific functions
7. Identify main functions of the systems of the human organism
8. Recognize levels of organization
9. Recognize functions of cells
10. Describe responses that result from internal stimuli
11. Describe parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems
12. Investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors

Grade Level: 6th, 7th, 8th

Materials

- *Introduction to Zoonotic Diseases* PowerPoint
- *What's Wrong with This Picture?* PowerPoint
- *What's Wrong with This Picture?* Activity Sheet



**This lesson can
be found online at
[http://peer.tamu.edu/FAZD/Science
Teacher
Resources.asp](http://peer.tamu.edu/FAZD/ScienceTeacherResources.asp)**

Lesson Overview

Zoonotic diseases (or zoonoses) are infectious diseases that are transmitted from vertebrate animals to humans under natural conditions. Zoonoses can be transmitted from a variety of animal species, including companion animals (dogs and cats), livestock (cows and pigs), and wildlife (raccoons and birds). Zoonotic diseases can be bacterial, viral, fungal, parasitic, or prion in nature. There are a variety of modes of transmission for zoonotic diseases, including direct transmission (via a bite from an infected animal or through skin contact with the infected animal) and indirect transmission (via an insect bite or through infected bedding or dust).

The main objective of this lesson is to teach middle school students about zoonotic diseases and, in the process, strengthen their education in science. Teaching students to understand the importance of zoonotic diseases in today's society will help create a more scientifically literate generation that will better understand the significance of biomedical research.

This lesson begins with a veterinarian visit that will excite and encourage students to learn about required scientific topics. Students will learn about what types of organisms can be zoonotic and how these organisms can be transmitted. The importance of animals in everyday life will be addressed, as will the question of how to maintain these vital relationships with animals while keeping ourselves safe from potentially dangerous diseases.

Hands-on activities that cover science skills such as science through inquiry and scientific problem solving skills are included in this curriculum module. The goal of this curriculum module is to show students the real world application for the content they are learning in class and to invoke a sense of excitement about science.

Presentation

An *Introduction to Zoonotic Diseases* PowerPoint presentation covers the main kinds of disease agents that can be zoonotic and how they are transmitted. The presentation shows how veterinarians are involved in controlling zoonotic diseases and offers ways to protect oneself from transmission.

Included in the lesson is a discussion section that features students talking about their experiences with being sick and discussing specific diseases, their causes, transmission, and organism types. Students can also make a chart to illustrate these relationships.

The activity *What's Wrong with This Picture?* is designed to help students identify risky situations in terms of zoonotic disease transmission. It features a PowerPoint with pictures that the students will study briefly and identify what they think is wrong. After learning about zoonotic diseases, the students get a second chance to comment on the photos. ■

Lesson Plan

Introduction to Zoonotic Diseases

Where this lesson can be applied: This lesson can be used when teachers cover the unit on organisms and environments. The lesson also teaches scientific investigation and reasoning, scientific inquiry, critical thinking, and tools of scientific inquiry. Please see the “Read Me First” document in the “Zoonotic Diseases Curriculum” folder for more information.

Time needed for lesson: This lesson should take approximately 2 hours to complete.

Lesson Procedures: Based on the “5E” Model¹ – Engage, Explore, Explain, Elaborate, Evaluate

- **“Engage” Step**

- The veterinarian presentation (also available in video format) will excite and encourage students to learn about zoonotic diseases.
- This lesson is designed to capitalize on students’ natural interest in animals and motivate them to learn the required science curriculum.

- **“Explore” Step**

- This investigation is appropriate for middle school biology students. This step will involve having students talk about their experiences with being sick and having them start to discuss specific diseases, their causes, transmission, and organism types. Students can make a chart to illustrate these relationships.

- **“Explain” Step**

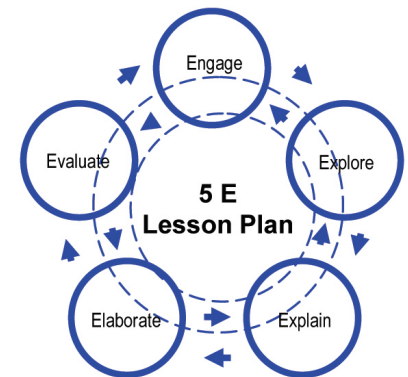
- There are several opportunities for the students to respond to questions in this presentation.
- There are also opportunities for students to give opinions and make inferences based on pictures or graphics in the presentation.
- There are notes to the teacher in the PowerPoint presentation when viewed in edit mode.

- **“Elaborate” Step**

- The activity “What’s Wrong with This Picture” is designed to help students identify risky situations related to zoonotic disease transmission.

- **“Evaluate” Step**

- Evaluation of student learning can take place by administering a short quiz after the completion of this lesson. The quiz and key are available in the “Zoonotic Diseases Curriculum” folder on the <http://www.peer.edu/fazd> website.



Resources for Teacher:

- 5 E model site and other lesson plan formats: <http://www.personal.psu.edu/scs15/idweb/lessonplanning.htm>
- FAZD curriculum on zoonotic diseases: <http://peer.tamu.edu/FADZ/ScienceTeacherResources.asp>

¹ See 5E Model link under Resources at end of lesson plan

Activity Sheet

Student Name: _____ Date: _____

Teacher: _____ Period: _____

What's Wrong with This Picture?

Instructions: Write what you think is wrong with what is happening in each of the following pictures. If you do not know what is wrong, make an educated guess!

Worksheet

1.



2.



3.



4.



5.



Partnership for Environmental Education and Rural Health

Objectives

1. Identify types of pathogens and describe diseases caused by pathogens
2. Understand ways to stop the spread of infectious agents
3. Understand the function of the immune system and distinguish between types of cells in the immune system
4. Analyze an infectious disease spread scenario by completing a web-based research project on the spread and control of rabies
5. Evaluate different sources of information and construct a plan of action to stop a local epidemic of rabies in the wildlife, livestock, and pets in their community
6. Determine a differential white blood cell count
7. Model the transmission of infectious disease in a hands-on lab activity
8. Become familiar with vaccination protocol
9. Complete pet vaccination histories based on case studies.

Grade Level: 9th, 10th, 11th, 12th

Materials

- *Pathogens* PowerPoint
- *Small Animal Vaccination Protocols*
- *Health Record Case Studies*
- *Infectious Disease Spread* Activity-Teacher
- *Infectious Disease Spread* Activity-Student
- Pet Health Record
- Pathogen Graphic Organizer
- Plastic cups-one for every student (they can be washed and reused each period)
- Saturated baking soda solution
- Vinegar
- Distilled Water
- Phenolphthalein indicator (see resources) or
- Boiled Cabbage indicator (recipe included)
- Small syringes without needles (for extension)
- Immunity PowerPoint Presentation
- White Blood Cell Count Activity Sheet
- Prepared Blood Slides (see teacher resources)
- How to Prepare Blood Slide Sheet
- Sample of animal blood obtained from veterinarian
- Microscopes
- Microscope slides and cover slips
- Romanowsky stain (Diff-Quik and other quick Wright's stains)
- New Methylene Blue stain (optional)
- Cell Counter (optional)
- *Rabies* PowerPoint Presentation
- *Rabies* Webquest PowerPoint Instructions
- *Rabies* Webquest Student Instruction Sheet with Rubric

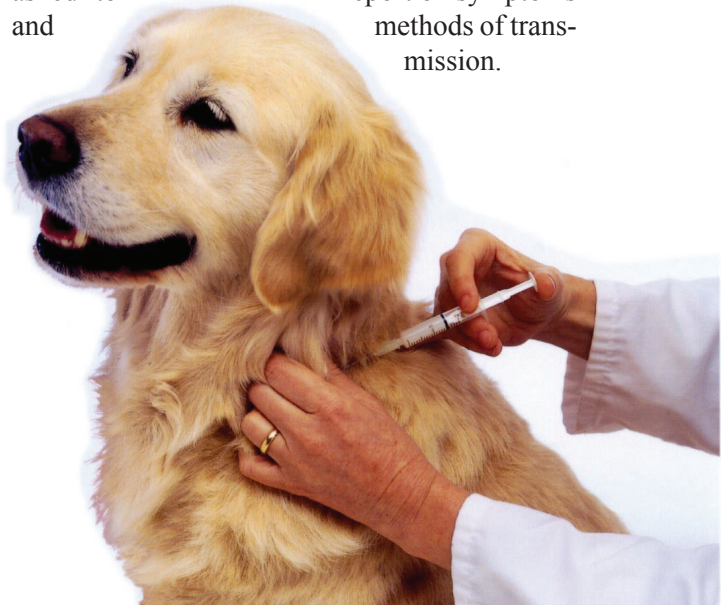
Lesson Overview

Infectious diseases and their spread are topics of national interest due to recent outbreaks. Infectious diseases are caused by many types of organisms and affect different systems of the body. Veterinarians and physicians need to know the causes of diseases and recognize their symptoms. The public can help stop the transmission of infectious diseases by following several easy steps. Infectious pathogens include some viruses, bacteria, fungi, protozoa, and abnormal proteins known as prions. Transmission of pathogens can occur in various ways including physical contact, contaminated food, body fluids, objects, airborne inhalation, or through vector organisms.

A visit from a veterinarian will encourage students to learn about required agricultural science topics. A veterinarian video presentation and a veterinary student video presentation are also available.

The veterinarian's presentation addresses the topics of vaccination and infectious diseases. The teacher can determine the most appropriate time for the veterinarian's visit. There are also two video presentations on vaccination available for use within the classroom.

The first follow-up lesson is on pathogens and infectious diseases. Several pathogens are defined. Many diseases that seriously affect animals are explored. An activity is included that uses a model to show transmission of infectious disease. Another asks students to review a small animal vaccination protocol and then apply that protocol to case studies. As an extension, students could be given a disease to study and asked to report on symptoms and methods of transmission.



The second lesson is a web-based inquiry on how to control the spread of rabies in a community. Students are given a hypothetical situation in which rabies has been found in their home community. Interactions between the people, pets, wildlife, and livestock in the area are emphasized. An informative lesson on rabies is included. Students are asked to use different resources to research and develop an action plan to stop the spread of rabies in their community.

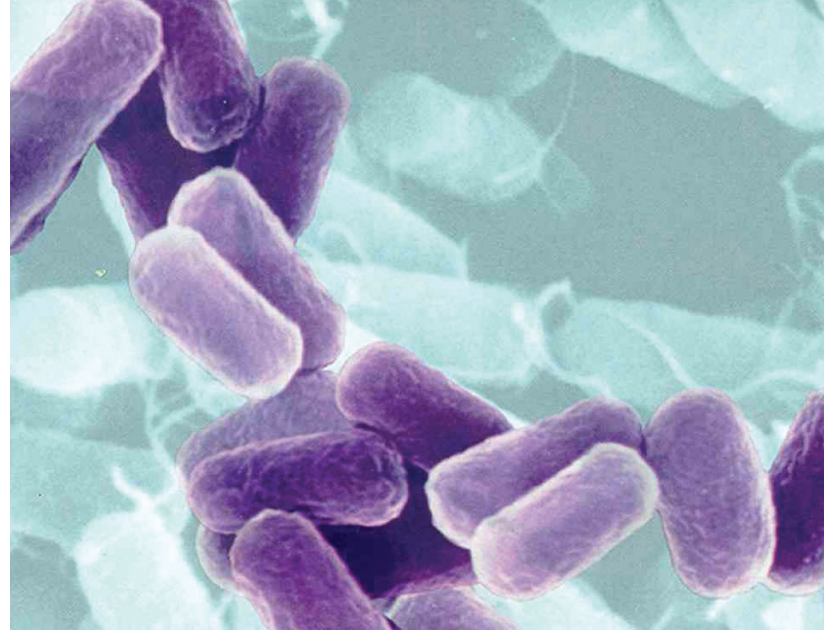
The third lesson is on immunity. This lesson covers the complex interactions that occur in the immune system and explores diseases of the immune system. The lesson includes an activity in which students conduct differential white blood cell counts using prepared blood smears. Instructions are also included for students to prepare their own blood smears.

Presentation

A PowerPoint presentation covering the primary types of pathogens is included with this module. The presentation covers a number of diseases and identifies the pathogens that cause them. It also presents ways to prevent the spread of pathogens. Due to the large number of pathogens, the tables of common diseases show only a fraction of the possible diseases caused by the pathogens. Many “thinking” questions are posed and a few “Quick Checks” are provided with review questions to add opportunities during the PowerPoint for student involvement. Answers to the “Quick Checks” and other notes are included in the notes section of the PowerPoint when it is in edit view.

A graphic organizer on pathogens is provided for students to use while taking notes. This organizer is a five-part chart entitled “Pathogens.” In the organizer is a section for each of the five pathogens covered. The students are asked to label each section with the name of the pathogen and fill out information to aid note taking.

The *Rabies* PowerPoint lesson defines and explains rabies. It shows the cause, symptoms and prevention of rabies. It also addresses rabies as a public health issue and introduces current rabies research. There are several opportunities for students to respond to questions and analyze graphs, tables and maps during this presentation. There are also opportunities for students to share opinions and make



inferences based on pictures or graphics in the presentation.

The *Structure of the Immune System* PowerPoint presentation defines and explains the structure and function of the immune system. It also explores the complex interactions between the different components of the immune system. There are several opportunities for the students to respond to questions during this presentation.

Vaccination Protocol and Case History Activity

In this activity, students are given a Pet Health Record for each of the Health Record Case Studies that the teacher directs the students to complete. Students may work in small groups with each group completing one Pet Health Record per case study. Students should complete the vaccination portion of the Pet Health Record for each case study. Students are instructed to include dates for future recommended vaccinations based on the *Small Animal Vaccination Protocol*. Students may use fictitious owner names, veterinarian names, and rabies tag numbers if desired.

Some of the vaccines included in the checklist of the Pet Health Record are not included in the protocols. Students should be informed that these are not core vaccines and thus administration schedules may vary. The teacher may wish to have students research these vaccines and present information about their use. ■

This lesson can be found online at

<http://peer.tamu.edu/VBB/AgTeacherResources.asp>

Directions: Read each case study carefully. Record the pet's name, date of birth, breed, sex (include whether it is spayed or neutered), and any other information available in the space provided. Fill out a Pet Health Record for each of the patients using the vaccination history provided by writing the age and date and checking the appropriate boxes for vaccinations given. On each Pet Health Record, enter dates for future recommended vaccinations based on the *Small Animal Vaccination Protocol/Schedule*. You will need a current calendar to do this. Write "recommended" to the left of the lines for the future procedures. Complete three years of the record in this way. Recommendations for deworming and diagnostic testing are also given in the case histories. Record these recommendations as well. Assume all animals have no signs of illnesses or disease.

Patient 1

Ginger is a female Golden Retriever dog. She is a solid golden color with no markings. She has been spayed. Her owner adopted her from a rescue organization therefore her medical history is unknown. She has been tested for heartworms and was found to be negative. She is approximately 11 years old.

Patient 2

Cailin is a female Rottweiler-mix dog. She is black and tan with white markings on each of her lower legs. She was adopted from the local animal shelter. She is approximately 6 weeks of age. This is her first visit to the veterinarian.

Patient 3

Molly is a solid black registered Labrador Retriever dog. She was purchased from a breeder and has not been spayed. The breeder has given the new owners a record of deworming and vaccination. The deworming was done at 2, 3, and 4 weeks of age. The vaccinations she was given by the breeder at 6 weeks of age included Canine distemper, Canine adenovirus-2, Canine parvovirus, and Canine parainfluenza. She was also given heartworm preventative at 6 weeks of age. Molly is now 9 weeks old.

Patient 4

Houdini is a Flame Point Siamese cat. He is an intact male. His owners report that he was a gift from a family friend and he is approximately 6 weeks old.

Patient 5

Winnie is a female domestic short-hair feline. She is a gray tabby. She was purchased by the owners as a kitten and she has been spayed. She has not been to a veterinarian in four years. She is 6 years old.

Vaccination Record

AGE	DATE	Canine										Feline							
		Lyme Disease	Distemper	Adenovirus 2	Parainfluenza	Parvovirus	Leptosira	Coronavirus	Bordetella	Canine/Feline	Giardiasis	Leukemia Virus	Panleukopenia	Calicivirus	Rhinotracheitis	Pneumonitis	FIP	Rabies	Other
___ Wks.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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1 Yr.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Yrs.	___	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Pet Health Record

To The Pet Owner

To live a long, healthy life, all pets require regular medical attention. This health folio provides a written record of your pet's medical background. It will be helpful if you have it available to update when you bring your pet to the veterinarian for vaccinations or medical exams.

Although brief, here are several topics that will certainly arise throughout the life of almost every pet.

Feeding

Your veterinarian may recommend a feeding program. A complete and balanced diet including protein, carbohydrates, vitamins and minerals is necessary for proper growth and disease resistance. Here are some guidelines:

- Puppies or kittens should be fed small amounts 3-4 times per day. At 6 months, reduce to twice per day and once per day for mature pets.
- Name-brand commercial pet food is carefully balanced to meet your pet's nutritional requirements. However, your veterinarian may recommend vitamin/mineral supplements.
- Table scraps disrupt your pet's balanced diet and should be avoided. Bones should never be fed.
- During pregnancy and nursing, your pet has special dietary needs. Check with your veterinarian for feeding instructions.
- Fresh water should be available at all times.

Vaccination

A routine vaccination program significantly increases your pet's likelihood of living a normal, healthy life. Some important diseases that should be considered for prevention appear in this health record under the section "Vaccination". For maximum protection, follow your veterinarian's advice and make sure your pet receives vaccinations and boosters when scheduled.

Spay-Neuter

There are many myths about spaying or neutering that should be dispelled. First, an animal does not have to produce "at least 1 litter of offspring" to lead a normal life. Second, animals will not always gain weight after spay or neuter. Although the tendency may be there, proper nutrition and exercise will reduce that likelihood. Third, it is not inhumane to sterilize an animal. The procedure is safe and effective.

Animal shelters and pounds across the country are burdened with unwanted animals. Responsible pet owners must take the lead in reducing the number of free-roaming animals and unwanted pets.

Parasite Control

A variety of parasites affect a pet throughout its lifetime. Treatment is usually simple but requires medications that must be used carefully and according to instructions. Proper sanitation will reduce likelihood and severity of many parasite infections, but regular medical exams and treatment are necessary for best control. Among the most important parasites that affect pets and require routine treatment are heartworms, worms of the gastrointestinal tract, fleas and ticks.

Surgery

Besides spay or neuter, it is not uncommon for your pet to require surgery at some point in its life. Accidents or other injuries as well as internal disorders may require surgical procedures.

Modern anesthetics and life-support agents similar to those found in human hospitals are available to your veterinarian and minimize risks of surgery. Pre- and post-surgical care require attention, and you should follow the instructions of your veterinarian. Withholding food or water the day the surgery is scheduled and confinement during recovery may be recommended. Medications could be prescribed after the surgery, and sutures may require removal.

My veterinarian is:



Pet Health Record

Name _____

Date of Birth _____ Sex _____

Breed _____

Markings _____

Owner _____

Address _____

City _____ State _____ Zip _____

Telephone _____ / _____

Breeder _____

Date Acquired _____

Objectives

1. Explore and understand the procedures used during a physical examination
2. Describe the “regional approach” to a physical exam
3. Distinguish between healthy and unhealthy characteristics of an animal
4. Describe and evaluate vital signs and explain why they might vary
5. Complete a physical exam record
6. Recognize common mistakes made during physical exams

Grade Level: 9th, 10th, 11th, 12th

Materials

- *Performing a Physical Exam* PowerPoint
- *Vital Signs* Prezi
- Physical Exam Video
- Physical Exam Record
- *Is That Normal?* Case Studies and Worksheet
- *Have I Missed Anything?* Video
- *Have I Missed Anything?* Worksheet

Lesson Overview

The physical examination is the most important aspect of clinical diagnosis. To identify an illness or abnormal situation, you must first be able to recognize what is normal. A good physical examination can detect minor abnormalities before they become serious problems as well as identify major organ dysfunction without extensive and expensive medical tests. In addition to evaluating the overall health of an animal, the physical exam provides the veterinarian the opportunity to educate clients about current topics in veterinary medicine and the impact these may have on the client.

This veterinarian’s visit introduces the students to the procedures used in a physical examination. The veterinarian discusses characteristics of a healthy animal, how to take vital signs, and the “regional approach” to performing a physical examination. Students will understand the importance of recognizing normal vital signs and characteristics of a healthy animal. The Veterinarians’ Black Bag presentation stresses to students the importance of scientific inquiry and investigations. Performing a physical exam correlates well with a scientist completing the



steps of the scientific method: the veterinarian must ask questions, research, make educated guesses, collect data, and often experiment. It is important for students to realize that veterinary medicine is based on fundamental science concepts. This lesson shows students the real world application of the science they learn in the classroom.

In the *Is That Normal?* activity, students will analyze physical exam case studies to determine if vital signs fall within the normal range for a particular species. Follow-up questions require students to think critically about the causes of variations in vital signs.

Completing a physical exam record provides a real-world experience for students as they work through the physical exam process. The student can complete this activity using live animals (under the supervision of a veterinarian, veterinary technician, or certified teacher) or it can be adapted by allowing students to complete the physical exam record while viewing a video of a physical exam conducted by a veterinary student.

In the final activity, students evaluate a video of a physical exam performed with intentional errors. The student must provide justification for their evaluation by recalling the appropriate procedures followed in a physical exam.

Presentation

This module begins with a visit from a veterinarian who will present the *Physical Exam* PowerPoint. This presentation will provide students with foundational knowledge about: the purpose of a physical exam,

Vital Signs Variations



Young students learn from a vet student how to take vital signs from a dog.

procedures used during a physical exam, characteristics of a healthy animal, measuring vital signs, and the “regional approach” used during a physical exam. Having a veterinarian present this information should capture the students’ interest while allowing them to experience “real-world” application of the material. If a veterinarian is unavailable to present the slideshow, the teacher may use it as introductory notes on the unit. In either case, it is recommended that students take notes on the presentation for use in future activities.

Following the veterinarian’s presentation, the teacher should then show the *Performing a Physical Exam* PowerPoint. This presentation is designed to actively review and reinforce the information gained from the previous “Physical Exam” PowerPoint and prepare students to successfully complete the physical exam activities follow. During this PowerPoint, there are multiple stopping points imbedded to allow for small group discussions and inquiry.

Is That Normal? Activity Plan

Begin this activity by showing the Prezi “Vital Signs” (<http://prezi.com/lao26jsmjunb/vital-signs/>) to your students. Discuss what normal and abnormal vital signs may indicate. Next have the

typically includes

- Mucous Membranes
- Temperature
- Capillary Refill Time
- Heart Rate
- Respiration Rate

Vital signs that are higher or lower than normal often indicate poor health.

students work in small groups to read and analyze the *Is That Normal?* physical exam case studies. As they read through the case studies, students should complete the data tables and answer the questions on the student worksheet. ■

This lesson can be found online at
<http://peer.tamu.edu/VBB/AgTeacherResources.asp>

Worksheet

Student Name: _____ Date: _____

Teacher: _____ Period: _____

Is That Normal?

1. Record in the data table any vital signs that fall outside of the normal range.

Abnormal Vital Signs

Species	Heart Rate (HR) bpm	Respiratory Rate (RR) bpm	Temperature °F
Case 1			
Case 2			
Case 3			
Case 4			
Case 5			
Case 6			

2. Record in the data table the variation from the average (higher or lower and by how much).

Difference in Normal and Abnormal Vital Signs

Species	Heart Rate (HR) bpm	Respiratory Rate (RR) bpm	Temperature °F
Case 1			
Case 2			
Case 3			
Case 4			
Case 5			
Case 6			

3. Provide a possible explanation for any variations in the vital sign measurements. What information from the patient history helped form this explanation?

Case 1 _____

Case 2 _____

Case 3 _____

Case 4 _____

Case 5 _____

Case 6 _____

Explain why vital sign measurements may vary greatly from the average yet not be considered truly abnormal.



A young student observes microscopic parasites to identify eggs in a sample.

Lesson Overview

Parasites are a major concern to the veterinary medical industry and billions of dollars are spent trying to decrease parasites in animals. It is important for students to understand that parasites can cause serious damage and sometimes even death to the host. Many of these parasites not only cause disease in animals but may also infect humans. Zoonotic diseases are those that may be passed between animals and humans through parasitic trans-

mission. This is an increasingly important field in medicine, as approximately 75% of recently emerging infectious diseases affecting humans are diseases of animal origin and approximately 60% of all human pathogens are zoonotic.

This veterinarian's visit introduces the students to a number of different common parasites seen in their own pets and livestock. The veterinarian also discusses the cause of parasite infestations, how to diagnose and treat animals with parasites, how to prevent future parasite infestations, and current research about the creation of new medications for the treatment and prevention of parasites.

In an activity designed to expand their understanding of the parasite – host relationship, students analyze images of parasites in different stages of their lifecycle to determine what environment each would inhabit. Analytical questions about the specific parasite studied provide closure for this activity.

In a hands-on lab activity, students analyze the feces from an animal and identify and count the number of parasite eggs and parasites present in the sample. Analytical questions exploring the rationale of the fecal floatation process accompany this exercise.

A third activity provides a creative demonstration of the student's understanding of a parasite lifecycle. Students create comic strips depicting the life of a specific parasite and expand their thinking by determining if, how, and where the lifecycle will end.

A final hands-on lab activity allows students to explore homemade pond water for living organisms, including some parasites. Students will follow the steps of scientific investigation and fill out a worksheet as they complete these steps. Students will also compare the types of organisms they find and attempt to identify them.

Objectives

1. Distinguish between internal and external parasites and identify common parasites of domestic animals
2. Describe direct and indirect life cycles and pair stages of the life cycle with the appropriate host
3. Explain the transmission of parasites, the effects of parasite infestation, and how to diagnose and treat parasite infestation
4. Conduct a fecal exam and identify any parasites found
5. Educate about current parasite research

Grade Level: 9th, 10th, 11th, 12th

Materials

- *Parasite Host Relationships and Life Cycle PowerPoint*
- CDC Information on Parasite Life Cycles
- Helpful Teacher Information on Parasite Host Relationships
- *Fecal Egg Count Activity*
- *Homemade Pond Water Data Collection Worksheet*
- *My Life as a Parasite Activity*
- *Lifecycle Match-up Activity*
- *Guide to Common Parasites Parasite Lifecycle Cards*
- Graduated cylinders
- Beakers
- Dry grass, mud from edge of pond or puddle, or dry hay
- Water
- Slides and cover slips
- Microscopes
- Eye dropper
- Test tube or small prescription pill bottle
- Floatation Solution (<http://www.goatbiology.com/fecalsolution.html>)
- Fresh Goat feces (goat feces work the best but if you can't get goat feces try getting a fecal sample from the shelter or as a last resort use fecal samples from pets)
- Small disposable cups (2)
- Cheesecloth
- Popsicle Stick
- Pipette
- Paper towel

Presentation

This module begins with a visit from a veterinarian who will present the *Parasite PowerPoint*. This presentation will provide students with foundational knowledge about: types of parasites, lifecycles, common parasite identification, parasite transmission, effects of parasites, methods of diagnosis, treatment and prevention of parasites, and current research on parasites. Having a veterinarian present this information will capture the students' interest while allowing them to experience "real-world" application of the material. If a veterinarian is unavailable to present the slide show, the teacher could also use it as introductory notes on the unit.

Following the veterinarian's presentation is the *Parasite Host Relationship and Life Cycles PowerPoint*. This presentation is designed to review and reinforce the information gained from the veterinarian's presentation and prepare students to successfully complete the activities to follow. During this PowerPoint, there are multiple stopping points imbedded to allow for small group discussions and inquiry.

Fecal Egg Count Activity Plan

This activity is best if done in small groups but may be completed as a class project if there are not enough microscopes.

1. In one of the disposable cups, place approximately 3-4 goat pellets or a teaspoon of dog feces.
2. Add just enough flotation solution to cover the feces and mix well. Explain to the students how the flotation solution was made and tell them that it is a supersaturated salt solution with a density of approximately 1.2 kg/dm³.
3. Place the cheesecloth over the second cup and pour the fecal/flotation solution through the cheesecloth into the second cup. Have the students note the amount of plant material in the feces. If you are using dog feces, it is not necessary to filter the solution.
4. Carefully pour the liquid into the pill bottle (be careful not to overflow) until a meniscus forms - The liquid should form a slight bubble on the top of the pill bottle.
5. If it is not completely full, slowly add flotation solution until a meniscus forms at the top of the pill bottle.
6. Carefully place a cover slip on top of the meniscus (there should be no air between the top of the pill bottle and the cover slip). Let stand for 10 minutes to allow enough time for the eggs to float to the surface of the cover slip.
7. Lift the cover slip off of the pill bottle and place on a slide.
8. Examine the slide under magnification, first with the 10x objective to locate the eggs and then using higher

This lesson can be found online at

<http://peer.tamu.edu/VBB/AgTeacherResources.asp>

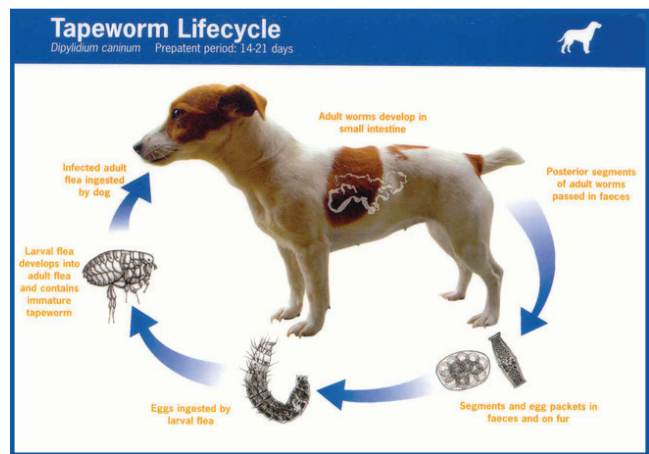


Photo courtesy of www.balgownievvet.com.

magnification to examine the individual eggs. (Microscope Techniques)

9. Help the students identify eggs in the sample. (Bubbles have a thick smooth black ring while eggs tend to have a more irregular surface and something in the middle).

10. Have the students draw and write about what they see and note how many eggs they count on their slide.

Life Cycle Match-Up Activity Plan

Print and laminate the lifecycle cards. These cards include 6 different parasite lifecycles illustrating the stage of the parasite and the environment in which it exists. This activity has two different "play" options:

Option 1: This is the more active game-type option. Begin by providing students with the *Guide to Common Parasite Lifecycles* in the *Parasite/Host Relationships* Module. Briefly discuss each lifecycle. Randomly distribute the parasite lifecycle cards to the students. Some students will receive a card with the picture and name of a parasite in a particular stage of its lifecycle. Other students will receive a card with a picture of an environment within which the parasite inhabits. Instruct students to first find the person with the environment particular to their lifecycle stage. Once everyone has a "home", instruct them to stand in a circle in the appropriate sequence for that particular lifecycle. Finally, have the students share their parasite lifecycle with the class. For an inquiry-based activity, have students attempt this without the aid of the "Lifecycle Guide."

Option 2: Divide students into six groups. Provide each group with a set of cards for a specific parasite. Have the group match the lifecycle stage with the correct environment and then place them in the appropriate sequence. Allow each group to describe their assigned parasite lifecycle. ■

Worksheet

Student Name: _____ Date: _____

Teacher: _____ Period: _____

Fecal Egg Count Analysis Questions

- 1) Why is a salt solution used for the fecal flotation?

- 2) Why doesn't the supersaturated solution cause dehydration of the eggs and make them shrivel from osmosis?

- 3) Why do we filter the solution through cheesecloth?

- 4) What are some methods you can use to identify the different eggs?

- 5) Why would it be important to count the eggs found on a slide?

- 6) Why do you want to use fresh goat feces?

Worksheet

Student Name: _____ Date: _____

Teacher: _____ Period: _____

Life Cycle Match-up Analysis Questions

- 1) Describe the lifecycle of the parasite you were given.
- 2) Is this lifecycle direct or indirect? Justify your answer.
- 3) Describe how the lifecycle of this parasite might be broken without the administration of drugs.
- 4) Describe how the lifecycle of this parasite might be broken with the administration of drugs.
- 5) Would the same stage of the lifecycle be affected by the actions taken in questions 3 and 4? Explain.
- 6) Why is it important to perform a fecal exam before administering drugs in controlling parasites?



Lesson Overview

Students from a rural or farm background are well aware of how common it is to castrate farm animals. They know that castration is an essential part of any selective breeding program so that only the “best” males are allowed to breed. They may not know much about castrating or gelding race horses, which is covered in this lesson. Nor may they know much about the effects of male sex hormone on behavior, food quality, or athletic performance. These topics are also covered in the lesson. Students from urban areas may find all of this quite eye-opening. They probably do not think much about the effect of castration on the quality of meat they get from the grocery store.

In this lesson, students will be able to interact with a veterinarian and relate real world experiences to the topic of castration. Students will be excited to share their experiences and will want to learn more about the upcoming lesson. They will be intrigued to see how the teacher is going to transition from this presentation an actual classroom lesson. This is a successful example of how to hook students at the beginning of a new lesson or unit. The veterinarian’s presentation on spaying and neutering explains the benefits of spaying and neutering/castration and their role in preventing pet overpopulation. A veterinarian video presentation is also available for use if a veterinarian cannot visit the classroom.

The first follow-up activity focuses on reproductive hormones. Students will research the reproductive physiology and behavior of a livestock animal or pet of their choice, including differences between males and females of the species, age of puberty, gestation (pregnancy) length, number of young produced, behavior differences in male and female, how that behavior influences safe handling of the animal, and any other interesting facts about reproduction in that animal. The research can be presented in a report, display poster, or slideshow presentation (such as PowerPoint).

In the second activity, students will research the topic of hormone use in beef cattle production. They will decide if they are for or against the use of hormones and write a persuasive paper stating their view. Extended lessons are provided that include making an educational brochure and researching the use of antibiotics in beef cattle.

Finally, an activity focusing on castration of farm animals and race horses is included. In this activity, the students will understand and describe why people castrate farm animals and race horses. They will identify the effects of testosterone on muscle and learn about the effects of castration on the racing performance of horses. Students will examine and analyze data from research and use that data to draw conclusions and formulate recommendations for safe animal management and handling.

This lesson can be found online at
<http://peer.tamu.edu/VBB/AgTeacherResources.asp>

Objectives

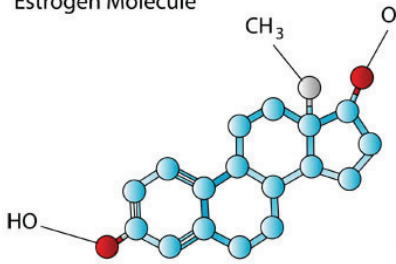
1. Understand and describe why people castrate farm animals and race horses
2. Identify the effects of testosterone on muscle
3. Understand the effects of castration on the racing performance of horses
4. Learn the major functions of the reproductive hormones estrogen and testosterone and understand the chemical structure of these hormones.
5. Learn historical background on reproductive hormone use and research
6. Examine and analyze data from research and use that data to draw conclusions and formulate recommendations for safe animal management and handling.

Grade Level: 9th, 10th, 11th, 12th

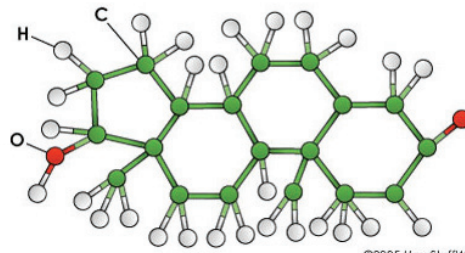
Materials

- *Castrating Farm Animals and Race Horses Tutorial*
- *Castrating Farm Animals and Race Horses Worksheet*
- *Castrating Farm Animals and Race Horses Worksheet Key*
- *A Dangerous Occupation Data Analysis Activity*
- *A Dangerous Occupation Key*
- *Reproductive Hormones PowerPoint Presentation*
- Access to computers with Internet connection for research purposes

Estrogen Molecule



Testosterone Molecule (C₁₉H₂₈O₂)



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Presentation

The *Reproductive Hormones* PowerPoint presentation teaches the students about the reproductive hormones estrogen and testosterone and their chemical structure. The history of reproductive hormone research is also covered. There are opportunities in the PowerPoint for students to answer questions and interact through discussion.

A Dangerous Occupation Activity Plan

In this activity, students will examine the data collected in a study concerning fatalities caused by cattle. Students will be asked to calculate percentages and mean (average) from data given in a data table taken from a research article. They will then be asked to draw conclusions based on that data. Based on the data presented, students will be asked to give suggestions for improving procedures for the management and handling of cattle by farmers and ranchers.

Use of Hormones in Beef Writing Activity

Hand out the *Use of Hormones in Beef Writing* activity sheet and introduce the topic by discussing the background information in the assignment. Read over the instructions and the guiding questions for the research. Students will need access to computers in order to use the suggested websites for their research. There is much information on this topic. You will need to lead a discussion on which resources are appropriate for use as references. There are many anecdotal resources making claims about eating beef, many of which have no scientific research to back them up. This is a great “teachable moment” for helping students see the difference between facts and opinions or hearsay. This can be a very good exercise in web information discernment. Allow time in class to write the paper or assign it for homework after their research is done. Lead a discussion on the topic once students have completed their papers. Use the guiding questions as a starter for the discussion. This is a controversial topic, with entire nations taking sides, so expect some strong opinions.



As an extension of this activity, an oral debate can be held. Resources for conducting a debate are included in the “Resources for Teacher” section at the end of this lesson plan. Debates may also be held according to 4-H or FFA procedures in order to prepare students for contests. ■

A Love For Animals

Capitalizing on the natural interest of children in animals and in the work of veterinarians, PEER’s development of curricular materials for veterinarians to present in schools, follow-up lessons for teachers to present, and take-home pamphlets for parents and the general public engages large numbers of middle and high school students and teachers in topics that promote science, research, and careers in biomedical sciences.



Data Analysis Activity

Student Name: _____ Date: _____
Teacher: _____ Period: _____

A Dangerous Occupation



Examining Fatalities Caused by Cattle

Purpose: To analyze data from a scientific study of fatalities caused by cattle. To draw conclusions and make suggestions about reducing risks associated with handling cattle.

Background Information: The frequent handling of animals on farms makes farm workers extremely vulnerable to animal-related accidents. Many of these accidents can slow down operations and cause serious economic losses as well as human grief and suffering. Results of a recent farm accident survey of nearly 2,000 dairy farms indicate:

- About 15 percent of all work-related accidents involved animals.
- Many of the victims were stepped on, kicked, fallen on or crushed by cows; or mauled and gored by dairy bulls.

Procedure: You will examine the data from a study that compiled data from fatalities caused by cattle in Iowa, Kansas, Missouri, and Nebraska from 2003-2007. You will analyze the data and make suggestions on how to make the farm workplace safer.

Read the following excerpt:

Fatalities Caused by Cattle --- Four States, 2003--2008¹

Large livestock are powerful, quick, protective of their territory and offspring, and especially unpredictable during breeding and birthing periods. Mothering livestock often protect their young aggressively. Dairy bulls, which have more frequent contact with humans than do beef cattle, are known to be especially possessive of their herd and occasionally disrupt daily feeding, cleaning, and milking routines. To reduce the risk for death from cattle-caused injuries, farmers and ranchers should be aware of and follow recommended practices for safe livestock-handling facilities and proper precautions for working with cattle, especially cattle that have exhibited aggressiveness.

Answer the following questions in your own words:

1. Why are large livestock so dangerous?
2. When are cows and bulls most likely to be aggressive?
3. What can farmers and ranchers do to help reduce their risk of being injured?

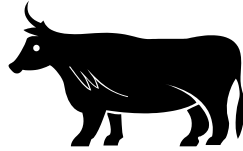
¹ From the Article published by the Centers for Disease Control and Prevention titled Fatalities Caused by Cattle --- Four States, 2003—2008 found at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5829a2.htm>

Writing Activity

Student Name: _____ Date: _____

Teacher: _____ Period: _____

The Use of Hormones to Stimulate Growth in Beef Cattle: Pro or Con?



Purpose:

You will research and write about the benefits (pros) or consequences (cons) of the use of hormones to stimulate growth in beef cattle.

Background Information:

The use of hormones to stimulate growth in beef cattle evokes strong emotions among those on both sides of the issue.

People who favor the use of hormones to stimulate growth in beef cattle show that hormone-fed beef products are safe and wholesome for consumers. They have researched the issue and shown that the use of hormones increases the efficiency of beef production, thus reducing energy and feed usage and environmental impacts. It also improves overall quality and healthfulness of beef by reducing the amount of fat.

On the other hand, those who oppose the use of hormones to stimulate growth in beef cattle believe the hormones result in hazardous residues in beef that lead to the development of health problems in humans. They also believe that waste from cattle given such hormones create residues that can run off into water sources and cause negative ecological impacts.

Procedure:

1. You are going to research the pros and cons of the use of hormones to stimulate growth in beef cattle. Here are some questions to help guide your research. Answer these on your own paper. For each answer, record the source of the information that you used. Remember: for the information to be scientific information, it must be **researched**, not just an **opinion** or **hearsay**. Look for **verification that the information you are reading is backed by scientific research**.

Why are hormones used in beef cattle production?

Which hormones are used in beef cattle? Are they natural or synthetic or both?

What are the effects of the hormones on the cattle and the beef from those cattle?

Do the hormones used in beef cattle production affect humans? the environment?

Are the claims for the use of growth hormones in beef cattle backed by scientific evidence?

Are the claims against the use of growth hormones in beef cattle backed by scientific evidence?

VETERINARIANS' VET STUDENTS' VET TECHNICIANS' VISITS TO PUBLIC SCHOOLS



SCIENTIST PRESENTATIONS ARE A WONDERFUL CHANCE FOR OUR STUDENTS TO SEE PROFESSIONALS IN ACTION. ALL THE HANDS-ON ACTIVITIES ARE INTERESTING TO THE STUDENTS. THEY TALK ABOUT THE LECTURE FOR WEEKS! IT IS ALWAYS EXCITING TO GET A VISITOR IN OUR RURAL CLASSROOMS.
-DEBBIE WEIR, LAZBUDDIE ISO

GETTING INVOLVED IN YOUR COMMUNITY CAN BE FUN AND FRUITFUL!

ROLE OF VISITORS

Expose students to the world of research and the life of a veterinarian, vet student, or vet tech. Explain:

- Investigation, including clinical diagnosis, involves critical thinking, imagination, intuition, use of your hands, and thinking on your feet
- Why veterinary medicine and biomedical-related careers are interesting, exciting, and stimulating
- What a typical day looks like
- How your work eventually makes it into the hands and minds of the public
- That good science and clinical investigation starts by asking questions and being curious!

CURRENT AND COMING CURRICULUM UNITS

- Clinical Trials (pre-requisite)
- Use of Animals in Research
- Arthritis
- Dental Health
- Diabetes
- Heart Disease
- Infectious Disease
- Neutering
- Nutrition & Obesity
- Parasites
- Physical Exam
- Vaccination

Curriculum Units available at:
<http://peer.tamu.edu/VBB/Summary.asp>

Barclay Bell

WHY PUBLIC SCHOOL OUTREACH?

- **Increased publicity** from newspapers, schools and local community gives instant recognition to a recently graduated veterinarian
- **An opportunity for service** to the community through the education of youth
- **Increased awareness** of public health issues helps narrow the focus of veterinary treatment by identifying client needs
- **Valuable interaction** with community youth makes connections and establishes personal contact

HOW CAN I IMPROVE EDUCATION IN PUBLIC SCHOOLS?

As a veterinarian, vet student, or vet tech you have an ability to motivate students to make choices that positively impact their futures. You have the ability to:

- Stimulate critical thinking
- Stimulate an excitement about research
- Explain proper use of the scientific method
- Motivate students to take positions of leadership
- Interest students in science or medical careers

HOW DO I GET INVOLVED?

- Contact teachers
- Write letters to principals and/or superintendents
- Respond to school's requests for scientific input
- Participate in after-school programs
- Volunteer for your university/public school interaction programs
- Attend local PTA meetings
- Invite a class to your clinic for a field trip
- Allow students to shadow you for a day
- Offer biomedical science career counseling
- Participate in your local college recruitment
- Be a science fair judge or advisor
- Mentor a student in your clinic

- Be a guest speaker
- Attend Career Day
- Class experiments
- Donate supplies
- Send newspaper & magazine clippings of toxicological and current public health concerns to teachers

WHAT CAN I PRESENT?

- Life as a veterinarian, vet student, or vet tech
- Time preparing to reach goals
- Time spent on the job or at school each day
- Rewards
- Your specific career path
- Your interests or accomplishments in animal welfare
- Your area of study
- Current research
- The news
- Historical events
- Literature
- Ethical issues (animal use in research and biomedical instrument and appliance development)
- Facts and fun with terminology

• Pre-made presentations and follow-up lessons for teachers on our website:
peer.tamu.edu/VBB/Summary.asp

WHAT MAKES A GOOD PRESENTATION?

- Use diagnostic examples to illustrate the scientific method process
- Help teachers and students relate curricular topics (standards) to public health
- Explain biological medical concepts like ingestion, absorption, injection or inhalation as the four basic routes of environmental exposure
- Bring props and relate them to what the students already know.

WHAT DO I NEED TO REMEMBER?

- Time and the timing of your visit is critical! A school class period is generally 45 minutes long, but could be 90 minutes.
- Most teachers will have trouble adding to their curriculum so help them *enrich* it. Help teachers meet their excessive demands.
- Encourage an understanding of math and science.
- Be creative.
- Be supportive.
- Encourage entry into college to pursue biomedical-related careers.
- Have fun and enjoy the interaction.

WHAT SHOULD I EXPECT?

- Anything and everything!
- Requests for the class to visit your clinic
- Engagement
- Appreciation

WHAT DO THEY NEED?

- Flexibility and responsiveness to the teacher's needs/classroom restraints
- A stimulation of critical thinking, rational use of scientific method in diagnosis, and excitement of research.
- Career information & knowledge

HOW DO I RELATE TO STUDENTS?

- Make them laugh.
- Speak to them on their level.
- Use questions that the students can answer.
- Encourage their questions.
- Relax, be yourself, and have fun!

Help Students Understand and Appreciate Agricultural Research

Dr. W. R. Klemm

Ideas for improved crop and food animal production and for prevention and treatment of diseases, pests, and parasites comes from agricultural and veterinary medical research. This can be an alien world to youngsters, many of whom in rural areas may have never seen a scientist or a research lab. Students may not even realize that becoming a scientist is a career option. Incidentally, we conducted a recent survey showing that a large percentage of life scientists come from an FFA or 4H background.

The essence of scientific research is captured in the formal papers published in scholarly journals. Obviously, understanding such papers is too challenging for the typical secondary school student. So, for research reports with especially practical applications, teachers generally just tell students what the findings were. Students are told the *What* of the research but usually not the *Why*, *How*, and *So What*." This latter kind of information is crucial and typically found in the Introduction, Methods, and Discussion sections of the original research reports, which students do not see.

But suppose teachers had access to a few research papers that were re-written to be comprehensible to secondary school students. Then teachers could present research in a form that most authentically conveys the "scientific method" and which more fully engages students in the real world of agricultural and veterinary medical research. This contrasts with the common teaching practice of telling students about science and asking them to remember certain facts.

Well, our PEER group at Texas A&M has instituted a program that makes this kind of teaching possible. Our response is to re-write a scientific paper, using age-appropriate language that addresses topics that should interest this age group. The original report is re-written in a third-person narrative that includes background information, either as footnotes or as a separate support document. We have on our Website (<http://peer.tamu.edu/VBB/Science-TeacherResources.asp>) a "Scientific Inquiry" curriculum supplement that provides the following:

1. A generic lesson plan to be used with any transformed research paper,
2. A PowerPoint presentation on "Inquiry Learning,"
3. A PowerPoint presentation of "Scientific Investigations," and
4. Four critical thinking activities related to the adapted research paper.

The heart of the learning activity, however, is a simulated peer review exercise in which groups of students work together as a team to accomplish understanding, analysis, and critical and creative thinking about the research. The curriculum provides scaffolding questions to guide students as they work their way through the paper, one section at a time. A suggested grading rubric is provided. The lesson plan provides guidance on how to construct and manage learning teams. Each team is charged with presenting a final report on their analysis. The teacher can choose whether the report form is a document, PowerPoint, poster, or any other form. After students present their critiques and ideas, the teacher can hold a de-briefing session in which we provide a simu-

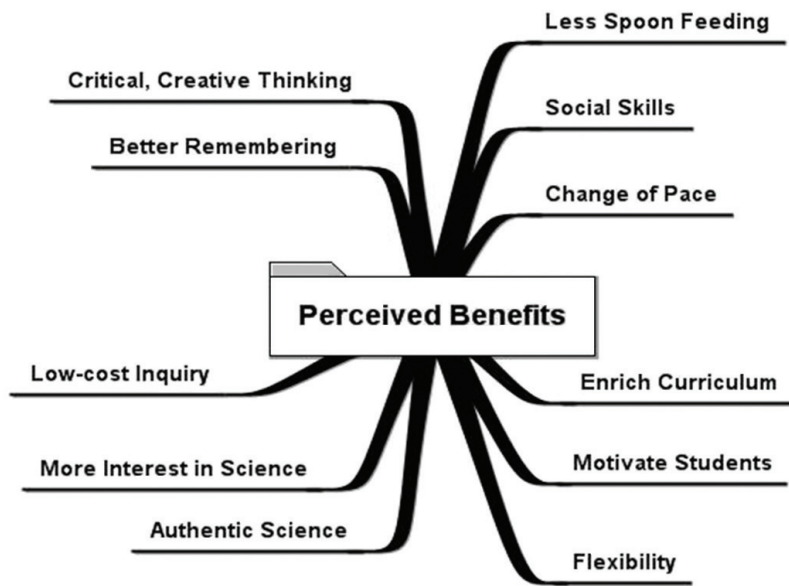
lated peer review on the same paper written by a practicing scientist.

We have four "adapted paper" lessons in our "library." Topics include reports on:

1. A clinical trial in Africa on preventing toxicity in humans eating aflatoxin-contaminated food.
2. Student test anxiety.
3. Brain activity in "animal hypnosis."
4. Training lab chimpanzees to volunteer for injections.

Of these, the aflatoxin paper is most relevant to vo-ag students because corn and peanut crops are frequently contaminated with mold-produced, carcinogenic aflatoxin. If a vo-ag teacher wishes to create an adapted paper on other topics, the process is not too hard. Just re-write each section from a third-person perspective describing what you think the authors said, using simpler language and providing supporting information. I advise providing only a minimum of "hand-holding," because the exercise should help students learn how to find information, figure out what it means, and use it to generate their own ideas. That is the reason a team approach is recommended, so they can leverage their individual time and capabilities to help each other. The advantages of this kind of learning are summarized in the diagram at the top of page 53.

I would stress the flexibility of this kind of teaching. A given learning experience can be as short as a couple of in-class days or, preferably, spread out over a few weeks as a "blended learning" exercise in which students use Internet homework to collect their information after which they ruminate on their ideas. The lesson plan pro-



vides options for choosing Web 2.0 group-work environments, which in itself is a useful learning experience. Deciding on which environment to use can serve as a useful “ice-breaker” for team members to get acquainted.

Another advantage is that the exercise can be used at any convenient time during a semester, as a change of pace, or as a “fill-in” for curriculum downtime after exams or the like.

Another, perhaps less obvious, benefit is that this experience spans the entire scope of Bloom’s Taxonomy. Students are not normally given many opportunities to present creative synthesis of their own ideas. Moreover, the “lower” Bloom level of “Knowledge” is given its due, because in this exercise students can’t evaluate critically

and develop good ideas unless they know what they are talking about. Memory of academic content is enhanced because this is an active and engaging experience, spread out over time, in which facts are used and applied in developing the analysis.

Note also that this is a genuine inquiry-learning activity that does not require laboratory supplies and equipment.

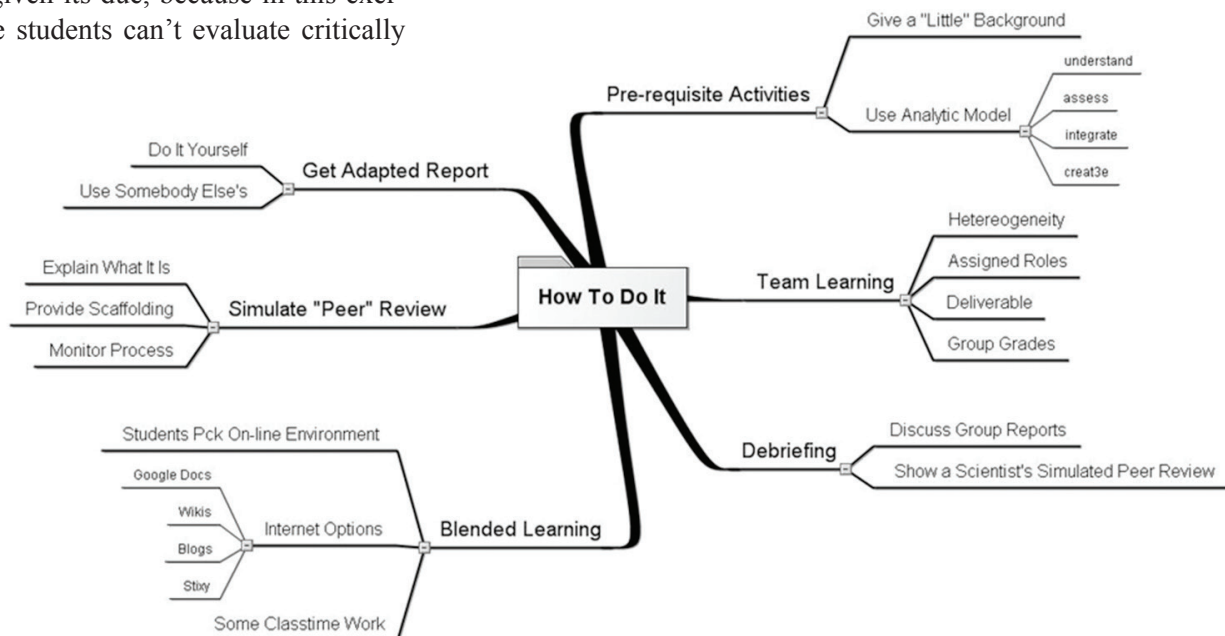
How To Implement

You may first want to show our PowerPoint on “Scientific Investigations” in the Clinical Trial model at <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp>. Then

you might want students to watch and discuss two short “Inquiry Learning” videos on what scientists are like and how they work (<http://peer.tamu.edu/presentations.asp>). Once a topic and paper are selected, you may want to provide a little background in lecture format (not too much, please). Then explain the analytical model described in the lesson plan. Form student learning teams according to guidance in the lesson plan, which also provides help for the students to learn how to operate a learning team effectively. Then explain what simulated peer review means and launch them into the exercise within your constraints of time and Internet access. Finally, insist on a report and conduct a debriefing session to show how different teams thought through the issues and compare that with how the scientist had conducted a similar review.

Conclusions

Of course, scientific method can be taught in other ways. However, we believe that this approach is a new model for teaching K-12 agriculture science in its most meaningful way. The experience of acting as peer reviewers on adapted published research papers exposes students to science as it is actually practiced in the real world. ■



Activities For Your Clinic



Lesson Includes:

- ★ Instructions
- ★ List of Materials
- ★ Instructor Back-ground Concepts
- ★ Recording Worksheet for Students
- ★ Topics for Further Discussion



BEAK BUSINESS

This activity involves the entire class participating in a hands-on activity in which they will simulate different kinds of birds with different beak designs to gather food in different niches.

To access this lesson online visit <http://peer.tamu.edu/VBB>

[/ScienceTeacherResources.asp](#) and scroll down to **"Behavior"**

Click the plus sign next to **"Animal Behavior"** to find the Beak Business Activity.



Lesson Includes:

- ★ Instructions
- ★ List of Materials
- ★ Instructor Back-ground Concepts
- ★ Recording Worksheet for Students
- ★ Topics for Further Discussion

EGGS - PERIMENT

This activity is a demonstration of dental health and scientific inquiry. Students will learn about the biological reasons for tooth and enamel decay and the importance of brushing their teeth.



To access this lesson online visit

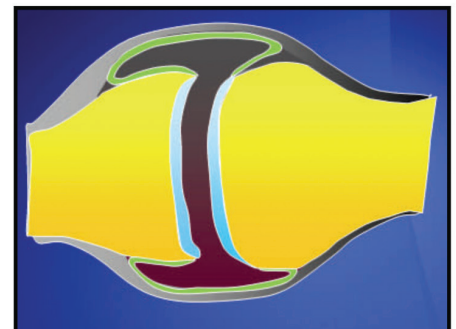
<http://peer.tamu.edu/VBB/ScienceTeacherResources.asp> and scroll down to **"Dental Health."** Click the plus sign next to **"Bacteria and Dental Health"** to find the Eggs and Soda and Eggs and Vinegar resources.

JOINT MODELING

This activity involves students in the study of the different types of joints, where they are located, and what they do. Students will create a model joint out of household objects using different objects to represent different parts of the joint.

Lesson Includes:

- ★ Instructions
- ★ List of Materials
- ★ Color-Coding Worksheet for Students
- ★ Step-by-Step Picture Instructions
- ★ Additional Web Activity



To access this lesson online visit <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp> and scroll down to **"Arthritis."** Click the plus sign next to **"Arthritis and the Joints"** to find the Joint Modeling resources.

For more ideas and activities, check out peer.tamu.edu!

DRUG LABELS

Students will learn about the kinds of dental health products the FDA regulates and how to read the Drug Facts labels on over-the-counter drugs. Students will compare and contrast prescription and over-the-counter medications.



Drug Facts	
Active ingredient(s) in each tablet(s)	Purpose
<small>Use only as directed. See the back of the container for complete directions. See the back of the container for complete directions. See the back of the container for complete directions.</small>	
Warnings	Directions
Other information	Caution

Lesson Includes:

- ★ Activity Instructions
- ★ List of Materials
- ★ Background Concepts for Instructors
- ★ Recording Worksheet for Students
- ★ PowerPoint Presentation
- ★ Additional Resources

THIS MEDICATION MAY AFFECT MENTAL ALERTNESS AND/OR COORDINATION. IF AFFECTED DO NOT DRIVE A MOTOR VEHICLE OR OPERATE MACHINERY.

THIS MEDICATION MAY CAUSE DROWSINESS AND INCREASE THE EFFECTS OF ALCOHOL. IF AFFECTED DO NOT DRIVE A MOTOR VEHICLE OR OPERATE MACHINERY.

DO NOT TAKE THIS DRUG IF YOU BECOME PREGNANT

FOR EXTERNAL USE ONLY

To access this lesson online visit <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp> and scroll down to “Dental Health.” Click the plus sign next to “FDA Role in Medicine Safety and Use” to find the Drug Labels Handout.

Lesson Includes:

- ★ Activity Instructions
- ★ List of Materials
- ★ Review Worksheet for Students
- ★ Additional Resources



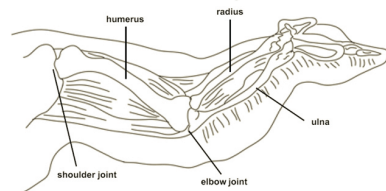
FISH ♥ CIRCULATION

In this activity, students learn how to view the tail of a goldfish under a microscope in order to see its blood vessels and circulation. Students will distinguish among the types of blood vessels, describe the flow of blood, and compare the structure and function of the blood vessels.



To access this lesson online visit <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp> and scroll down to “Heart Disease.” Click the plus sign next to “Heart Function” to find the Observing the Circulation in a Fish Lab.

This laboratory activity explores the structure and function of the bones in a chicken wing and compares them to the structure and function of the bones in humans. Detailed instructions are given and students are asked to investigate the bones, describe them, and make inferences about their function.



Lesson Includes:

- ★ Detailed Activity Instructions
- ★ List of Materials
- ★ Lab Review Worksheet for Students



CHICKEN WING

To access this lesson online visit <http://peer.tamu.edu/VBB/ScienceTeacherResources.asp> and scroll down to “Orthopedics.” Click the plus sign next to “Effect of Exercise on Bone Structure” to find the Chicken Wing Activity.



Science Resources for Middle and High Schools

- Home
- Teacher Resources
- Request a Lesson Plan
- Teacher Workshops
- Videos
- NSF GK-12 Program
- For Veterinarians

Video Presentations

SEPA - Science Education Partnership Award
National Center for Research Resources, NIH

Veterinary Student Presentations:		PowerPoints	
Canine Heartworms and Heartworm Disease	(16 minutes) view	download	
Dental Health in Veterinary Medicine	(18 minutes) view	download	
Diabetes Mellitus	(21 minutes) view	download	
Genetics	(27 minutes) view	download	
Orthopedics and Fractures	(12 minutes) view	download	
Physical Exam	(22 minutes) view	download	
Spaying and Neutering	(24 minutes) view	download	
Vaccination	(16 minutes) view	download	
Veterinarian Presentations:		PowerPoints	
Animal Research	(21 minutes) view	download	
Clinical Trials: Translational Medicine	(34 minutes) view	download	
Modern Careers in Veterinary Medicine	(34 minutes) view	download	
Neutering: Spaying and Castration see also Cat and Dog Populations	(11 minutes) view (7 minutes) view	download download	
Vaccination	(28 minutes) view	download	
Teacher Presentations:		PowerPoints	
Bring the Vet School to YOUR school	(10 minutes) view	download	

- Contact Us
- Veterinary and Science Partnership Lessons
- Take Home Brochures
- Vet Video Presentations
- Workshop Description
- Benefits to Veterinarians
- Related Lessons
- Program Summary

- Other Links
- Public School Collaborations

Southwest Regional GK-12 Site

Google Custom Search

These online videos by Texas A&M University veterinary students and professors cover topics related to heartworms, dental health, diabetes, orthopedics, and animals in research. They offer middle school classrooms the opportunity to have a virtual veterinarian at the click of a button.

- Contact Us
- Veterinary and Science Partnership Lessons
- Take Home Brochures
- Vet Video Presentations
- Vet Presentations
- Workshop Description
- Benefits to Veterinarians
- Related Lessons
- Program Summary

- Other Links
- Public School Collaborations
- Zoonotic Diseases
- Southwest Regional GK-12 Site

Veterinarian Presentations



SEPA - Science Education Partnership Award
National Center for Research Resources, NIH

Select a Presentation:

Animal Research Presentation

Animal Research

Partnership for Environmental Education and Rural Health
Texas A&M University
<http://peer.tamu.edu>

Animals in Research

Images of a white mouse, a monkey, a dog, and a cow in a laboratory setting.

What is research?

Scholarly or scientific investigation or inquiry

Images of a person in a lab, a beaker with a flame, and laboratory equipment.

Other Presentations

- Clinical Trials
- Animal Research**
- Diabetes
- Heart Disease
- Vaccination
- Behavior
- Parasites
- Orthopedics
- Physical Exam
- Arthritis
- Neutering
- Dental Health

Three Follow-up Lessons for Teachers!



Curriculum Overview:		Three follow-up lessons for Teachers		
	Presentation for Veterinarians	Pros & Cons of Animal Research	Case Study	Care of Lab Animals
Objectives	Students will: 1. Learn the scientific method 2. Understand the veterinarian's view on why it is useful and necessary, for both human and animal medicine, to use animals in biomedical research.	This lesson's purpose is to debate the use of animals in scientific research and to create an awareness of the scientific research community. Students will: 1. Research information on the use of animals in scientific research. 2. Tabulate results of a pre/post survey on using animals for research. 3. Conduct a debate on the pros and cons about animal use in research based on factual information. 4. Design a poster defending the key points.	Students will: 1. Learn how scientists follow the scientific method in their research. 2. Be able to explain how animal research has benefited human medicine. 3. Correctly interpret data using graphs.	Students will be able to: 1. Identify the alternatives to using animals in research and explain why it is still necessary to use animals. 2. Explain how the government regulates animal research and requires humane care of laboratory animals. 3. Explain what a central laboratory animal care facility is and how it operates. 4. Identify career fields represented in such facilities. 5. Explain the advantages of such facilities for the animals and for researchers.
Major Content	The scientific method, and human and animal benefits of animal research (examples: heart disease, infections, ophthalmology, joint problems, metabolic disorders)	The pros and cons of animal research (this lesson could be presented before the veterinarian's visit) Pre- and post-surveys will be used to see if opinions have changed as a result of the lesson.	Results of a study performed using monkeys and guinea pigs to determine whether the polio and DPT vaccines are more effective if given together or separately Students will be given the results of tests and asked to make their own conclusions by creating and interpreting graphs.	Standards used for the housing and care of laboratory animals, pictures of a modern laboratory animal care facility, and standard operational procedures
Props, special resources/ supporting material	1. PowerPoint, "Animal Research" 2. Websites 3. Pre and post-test worksheets	1. TV/VCR and the original version of the movie, Planet of the Apes (PG rated) (optional) 2. PowerPoint, "Using Animals in Research and Education" 3. Worksheet, "Animal Research Survey" 4. Various resource materials representing both sides of the animal rights issue 5. Poster paper or "cling sheets" that can be stuck to the wall.	1. Worksheet, "Case Study" 2. Calculator 3. Graphing Paper 4. Tutorial on scientific method (see below) (optional)	1. PowerPoint, "Laboratory Animal Care" 2. Tutorial, "Using Animals in Research" 3. Worksheet, "Care of Lab Animals"
Activities/ demos	Class discussion and worksheets	Discussion/debate and worksheets	Worksheets and web video or PowerPoint on scientific method (optional)	"Expert" role play, worksheets, group presentations, and class discussion
Student Assessment	Grade the pre and post-tests.	Grade the summary sheets and debate.	Grade the worksheet and graphs.	Grade the presentations and worksheet.

Following veterinarian's visits or video presentations, standard-based science instruction takes place in the form of follow-up lessons by teachers.

Lessons and classroom visits emphasize biomedical and physical science in an attempt to promote understanding of the research (basic, animal, and human clinical trials) and development process upon which modern medicine, both veterinary and human, depends.

Instructions for veterinarians and for teachers, as well as all lesson plans, are available for download.



Objectives

1. Distinguish between scientific decision-making methods and ethical/social decisions that involve the application of scientific information
2. Critical thinking and problem-solving
3. Conduct field investigations following ethical practices
4. Recognize moral issues and analyze moral concepts
5. Understand that most of the actions of those that practice or use science involve choices with moral implications
6. Recognize the difference between animal rights and animal welfare

Grade Level: 8th, 9th

Materials

- *Ethics in Veterinary Medicine* PowerPoint
- *Ethics in Veterinary Medicine* Worksheet
- *Animal Welfare* Worksheet

Resources

An Introduction to Veterinary Medical Ethics: Theory and Cases by Bernard E. Rollin

Lesson Overview

Are surgeries such as ear cropping, declawing or debarking always appropriate? Is it acceptable for animals to be hospitalized overnight without nurse supervision? Should animals be temporarily put to sleep for radiographs to lessen human exposure?

These are just a few of the ethical issues that arise in the veterinary medical field. Ethics involves an attempt to determine the best course of action when dealing with conflicting choices. Veterinarians, like most professionals, must consider their relationships with their patients, other veterinarians, and with society for determining how to best fulfill the needs of their profession.

The main objective of this lesson is to teach middle school students the difference between scientific decision-making methods and ethical/social decisions that involve the application of scientific information.

This lesson includes a PowerPoint presentation, which includes two case studies that involve students making decisions as a veterinarian and describing how they would handle certain situations. Developed from resources including *An Introduction to Veterinary Medical Ethics: Theory and Cases* by Bernard E. Rollin and animal welfare documents from the American Veterinary Medical Association (AVMA), these cases are real-world situations from which students can learn about veterinary medical ethics. The lesson also has students discuss the difference between animal rights and animal welfare.

Presentation

An “Ethics in Veterinary Medicine” PowerPoint Presentation introduces the topic of ethics and goes further by explaining veterinary ethics in accordance with the AVMA. This provides students with an understanding of the role that veterinarians play in society.

Throughout this lesson, there are numerous opportunities for discussion sessions in which students can develop ideas and voice opinions about real world matters in veterinary medical ethics.

The case study “Euthanasia of Treatable Horse for Insurance” requires that students determine the best course of action in the face of a difficult situation in which a valuable yearling thoroughbred horse is injured. There is also an opinion poll from the AVMA in which students give their comments on an animal welfare-related policy that is under review. ■



Ethics in Veterinary Medicine

Names: _____



Directions: You are a team of veterinarians faced with determining the best course of action in the face of a difficult situation. Read the scenario below and discuss, as a team, the consequences of each possible decision. Come up with what your team believes is the most ethical conclusion and prepare to explain to the rest of the class the reasoning behind your choice.

A valuable yearling thoroughbred horse is found at pasture with what looks like a badly injured left fore fetlock joint. After phoning your vet clinic, the farm manager contacts the insurance broker and their adjuster gives permission for euthanasia on humane grounds based on a presumed fracture with a poor prognosis.

Your group of veterinarians radiographs the limb and diagnoses an injury that should respond well to cast application, although racing performance will most likely be impaired. The owner requests that you euthanize the horse because the insurance broker has promised payment of thirty thousand dollars.

Your clinic phones the insurance broker and advises him that the condition is treatable. You are advised that the insurance broker has decided to make the payment to the owner out of kindness because the farm has not had a claim for several years.

Paraphrased from *An Introduction to Veterinary Medical Ethics: Theory and Cases* by Bernard E. Rollin

Notes: _____

Animal Welfare

Names: _____

As a member-driven organization, the American Veterinary Medical Association (AVMA) relies on quality input from its members to shape its policies and actions. As a team of veterinarians, you have the opportunity to provide comments on an animal welfare-related policy that is under review.

POLICY: *The AVMA strongly encourages owners of domestic cats in urban and suburban areas to keep them indoors.*

ACTION: The AVMA has requested that your team comment on the inclusion or exclusion of rural ("farm") cats from AVMA policy on keeping owned cats indoors.

ISSUE BACKGROUND: As part of its discussions, the Animal Welfare Committee (AWC) is considering whether there is a good reason for excluding rural cats from this policy. Cat longevity is related to how they are kept, with indoor cats living longer.¹ A study of free-roaming farm-associated cats in Illinois found that 75% of these cats died before reaching one year of age, and only 6% reached 3 years of age. The main causes of death were vehicles, disease, humans and dogs.²

However, outdoor cats may be untamed and some are only loosely owned by people who may consider them too wild for adoption as pets.³ They also may be kept for rodent control. Some researchers question the effectiveness of cats in pest control⁴ and suggest that farm cats present risks for transmitting diseases to livestock.⁵ Cats kept for pest control purposes also tend to receive less veterinary care.⁶

Cats housed indoors are also less likely to prey on wildlife. Free-roaming cats will kill species such as small mammals, frogs and lizards.^{2,8} Predation by cats is considered an important factor in bird population size, including species of conservation concern.

From http://www.avma.org/issues/policy/comments/ofc_free_roaming.asp

QUESTIONS:

1. Do you agree that urban and suburban cats should be housed indoors (for their safety and to protect wildlife)?
2. Is there a reason for suggesting that concerns about cats' safety and wildlife considerations in rural areas differ for those in urban and suburban areas?
3. Are there other good reasons for keeping rural cats outdoors? For keeping urban and suburban cats indoors?

1. Lacheretz A, Moreau D, Cathelain H. Causes of death and life expectancy in carnivorous pets (I). *Revue de Médecine Vétérinaire* 2002; 153: 819-822.

2. Warner RE Demography and movements of free-ranging domestic cats in rural Illinois. *J Wildl Manage* 1985;49:340-346.

3. Centonze LA, Levy JK. Characteristics of free-roaming cats and their caretakers. *J Am Vet Med Ass* 2002; 220: 1627-205.

4. Vantassel SV, Hygnstrom S, Ferraro D. *Controlling House Mice*. NebGuide: University of Nebraska—Lincoln extension, Institute of Agricultural and Natural resources. 2005.

5. Van Sambeek F, McMurray BL, Page RK. Incidence of Pasteurella in poultry house cats used for rodent control programs. *Avian Diseases* 1995;39:145-146.

6. Coleman JS, Temple SA. Rural residents' free-ranging domestic cats: a survey. *Wildl Soc Bull* 1993; 21: 381-390.

7. Lepczyk CA, Mertig AG, Liu J. Landowners and cat predation across rural-to-urban landscapes. *Bio Conserv* 2004;115:191-201.

8. Mitchell JC, Beck RA. Free-ranging domestic cat predation on native vertebrates in rural and urban Virginia. *Virginia J Sci* 1992; 43: 197207.

Animal Welfare

Beverly Crocker & Dr. Dan Posey



Animal welfare as defined by the American Veterinary Medical Association, AVMA, pertains to how an animal is coping with the conditions in which it lives. The AVMA further states that ensuring animal welfare is a human responsibility encompassing animal well-being, housing, management, nutrition, disease prevention and treatment, handling, and, when necessary, humane euthanasia.

Animal Welfare is the responsibility of the veterinary profession. The topic came to the forefront when the AVMA responded by revising the Veterinarian's Oath in January to better represent the responsibilities and requirements deemed by society for the veterinary profession. The revision was only four words, but its impact on the Oath displays clearly how the veterinary profession is dedicated to improving the lives of animals and the preservation of animal welfare. Veterinarians are the guardians of animal welfare.

The revised Oath is as follows, with the four new words appearing underlined: "Being admitted to the profession of veterinary medicine, I solemnly swear to use my scientific knowledge and skills for the benefit of society through the protection of animal health and welfare the prevention and relief of animal suffering, the conservation of animal resources, the promotion of public health, and the advancement of medical knowledge. I will practice my profession conscientiously, with dignity, and in keeping with the principles of veterinary medical

ethics. I accept as a lifelong obligation the continual improvement of my professional knowledge and competence."

The issue of animal welfare is closely tied to that of animal research. The AVMA policy states "Animals play a central and essential role in research, testing, and education for continued improvement in the health and welfare of human beings and animals. The AVMA endorses the Three R tenet of Russell and Burch (1959), which are: refinement of experimental methods to eliminate or reduce animal pain and distress; reduction of the number of animals consistent with sound experimental design; and replacement of animals with non-animal methods wherever feasible."

The AVMA supports the use of animals in "meaningful" research, and has numerous publications describing its protocols on the humane treatment and ethical responsibilities of facilities using animals for research. The Animal Welfare Act enforced by the U.S. Department of Agriculture (USDA) requires that all research institutions have an Institutional Animal Care and Use Committee (IACUC). The committee oversees care of all animals used in teaching and research and evaluates all research projects to ensure that animals will be treated humanely and that pain and distress will be minimized.

It remains that without the knowledge gained from animal research, millions of humans and animals would not be alive or would be liv-

AVMA Animal Welfare Principles

The AVMA, as a medical authority for the health and welfare of animals, offers the following eight integrated principles for developing and evaluating animal welfare policies, resolutions, and actions.

- The responsible use of animals for human purposes, such as companionship, food, fiber, recreation, work, education, exhibition, and research conducted for the benefit of both humans and animals, is consistent with the Veterinarian's Oath.
- Decisions regarding animal care, use, and welfare shall be made by balancing scientific knowledge and professional judgment with consideration of ethical and societal values.
- Animals must be provided water, food, proper handling, health care, and an environment appropriate to their care and use, with thoughtful consideration for their species-typical biology and behavior.
- Animals should be cared for in ways that minimize fear, pain, stress, and suffering.
- Procedures related to animal housing, management, care, and use should be continuously evaluated, and when indicated, refined or replaced.
- Conservation and management of animal populations should be humane, socially responsible, and scientifically prudent.
- Animals shall be treated with respect and dignity throughout their lives and, when necessary, provided a humane death.
- The veterinary profession shall continually strive to improve animal health and welfare through scientific research, education, collaboration, advocacy, and the development of legislation and regulations.

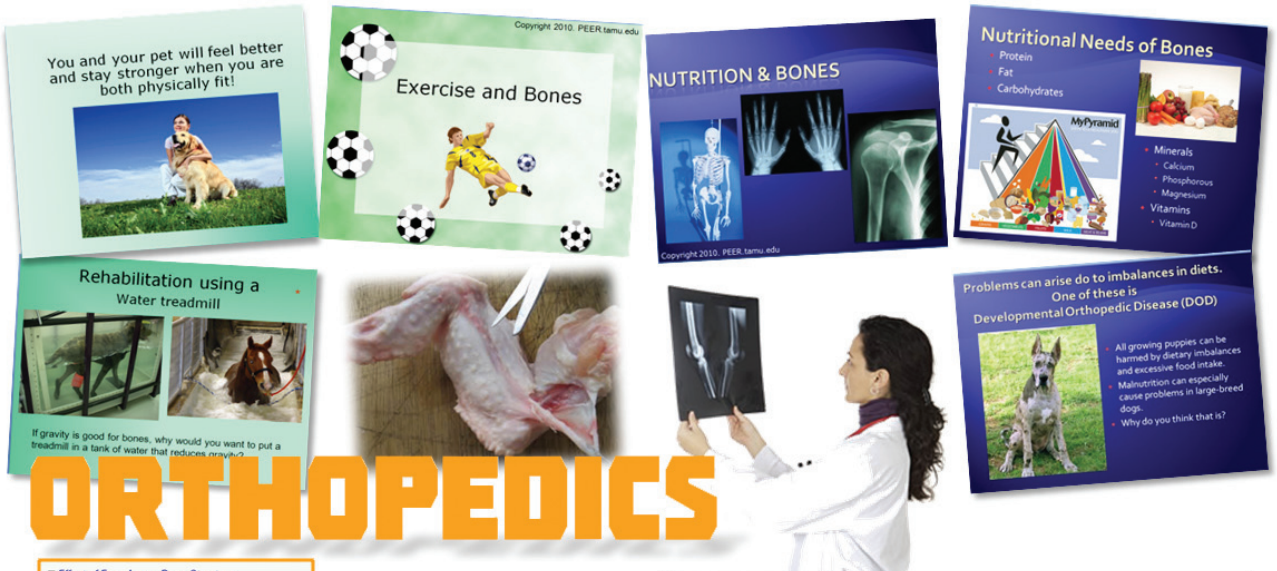
Taken from the November 2010 informative booklet on AVMA policy statements on animal welfare issues.

ing with a reduced quality of life. Clearly, the issue of animal welfare has an unwavering position of support in animal research from groups like the AVMA and research institutions like Texas A&M University.

The guiding principle of every individual that enters into the veterinary profession is to take the responsible role as the guardian of animal welfare. ■

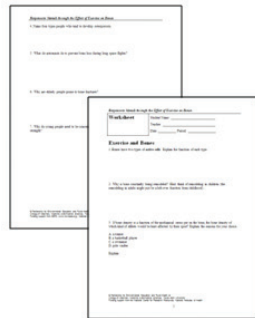


"The Texas A&M College of Veterinary Medicine & Biomedical Sciences is committed to animal health and welfare, and responsible use of animals in research for the advancement of discovery in the medical arena, as is also prescribed by the AVMA."
Dr. Bhanu Chowdhary, Associate Dean for Research



ORTHOPEDICS

- Effect of Exercise on Bone Structure
 - Read Me First Statement
 - Lesson Plan
 - PowerPoint (Effect of Exercise on Bones)
 - Effect of Exercise on Bones Worksheet
 - Exercise and Pain
 - Chicken Wing Activity
 - Welcome to the Future Activity
 - Movie - Dog in water treadmill
 - Science Investigations PowerPoint
- Effect of Nutrition on Bone Structure and Function
 - Read Me First Statement
 - Lesson Plan
 - PowerPoint (Effect of Nutrition on Bones)
 - Nutrition and Bone Sockets Worksheet
 - Strong Bone Challenge
 - Science Investigations PowerPoint
- Orthopedics Experiment Design
 - Read Me First Statement
 - Lesson Plan
 - PowerPoint (Clinical Studies in Orthopedics)
 - PowerPoint (History of Anticlog Joints)
 - Orthopedic Experiment Design Activity
 - Orthopedic Experiment Design Activity Subpic
 - Science Investigations PowerPoint
- Video: Veterinary Presentation on Orthopedics
 - View Student Video
 - Download PowerPoint



Orthopedic Exam

• Meet Sam & Simon!!

<http://peer.tamu.edu/VBB/ScienceTeacherResources.asp>

Age That Horse!

Approximately how old is this Horse?

How could you tell?

Inner Shape
See p. 3 of Tutorial



Borrelia burgdorferi (Lyme Disease)

Bacillus anthracis (Anthrax)

Staphylococcus aureus (Staph Infection)

What shape is this bacteria?

DENTAL HEALTH



What do vets look at animal teeth?

- Look for signs of disease
- Approximate the age of the animal



- Animal Teeth
 - Read Me First Statement
 - Lesson Plan
 - Animal Teeth Tutorial - Tutorial
 - Amazing Animal Teeth Activity
 - Animal Teeth Word Detective Chart
 - Ageing Horses by their Teeth - PowerPoint
 - Science Investigations PowerPoint
- Bacteria and Dental Health
 - Read Me First Statement
 - Lesson Plan
 - Bacteria and Dental Health Examples Of Bacteria - PowerPoint
 - Bacteria and Dental Health - Tutorial
 - Egg and Soda - Teacher Instructions
 - Egg and Soda - Worksheet
 - Egg and Vinegar - Teacher Instructions
 - Egg and Vinegar - Worksheet
 - Bacteria Most Wanted Poster
 - Bacteria KWL Chart
 - Science Investigations PowerPoint
- FDA Role in Medicine Safety and Use
 - Read Me First Statement
 - Lesson Plan
 - FDA Role in Medicine Safety and Use - PowerPoint
 - Drug Labels - Handout
 - Drug Labels - Worksheet
 - Find Those Facts - Worksheet
 - Find Those Facts - Worksheet Key
 - Is it a Drug - Article
 - Is it a Drug - Quiz
 - Science Investigations PowerPoint
- Video: Veterinary Presentation on Dental Health
 - View Student Video
 - Download PowerPoint

Agricultural Science Lessons

To provide opportunities and resources to students interested in becoming a veterinary assistant or technician, PEER has modified the VBB curriculum and teacher professional development for the high school veterinary assistant's program. Shown below are some current and coming high school Agricultural Science Lessons, which can be found at <http://peer.tamu.edu/VBB/AgTeacherResources.asp>

Parasites

Parasites

PEER Program
College of Veterinary Medicine and Biomedical Sciences
Texas A&M University

Types of Parasites

- Ectoparasites**
 - Live on the outside or skin of the host
 - Usually insects or arachnids (ticks, mites, or fleas)
- Endoparasites**
 - Parasites found within the body of the host
 - Can be in blood, tissue, or gastrointestinal tract
 - Nematodes, Trematodes, Cestodes and Protozoa

Diagnosing Parasite Infection

- Direct observation
- Blood antigen tests
- Direct blood smears
- Skin scraping
- Fecal exam
- Biopsy of tissues

Hookworm egg on fecal float Malaria on blood smear Sarcoptic mange on skin scraping

Castration

Reproductive Hormones

Estrogen and Testosterone

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Reproductive Hormones

- Certain hormones play key roles in reproduction.
- They cause different sexual characteristics in males and females and control fertility or the ability to have offspring.
- There are several reproductive hormones but the two major ones are **Estrogen and Testosterone**.

Average Age of Puberty

Average Age of Puberty (Range)		
Species	Male	Female
Bovine	11 mo (7-18)	11 mo (9-24)
Ovine	7 mo (6-9)	7 mo (4-14)
Porcine	7 mo (5-8)	6 mo (5-7)
Equine	14 mo (10-24)	18 mo (12-19)

Boer Goat Quarter Horse Duroc Pig

Vaccination

Pathogens

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What are Pathogens?

- Pathogens are microbes (microscopic living organisms) or other agents that cause diseases.
- Example: Foot and mouth disease is a highly contagious disease of cattle, swine, and other cloven-hoofed animals.
 - It is caused by a viral pathogen called *picornavirus*.
 - It causes blisters in the mouths and hooves of animals.

Viruses

- Symptoms of viral diseases are varied and related to the types of tissues that are infected. Viral diseases are commonly associated with infections of the skin, blood, liver, uterus, fetus, brain, lungs, stomach, and intestines.
- Diagnosis is done by virus isolation, ELISA* and PCR* testing. A decrease in lymphocytes on a CBC can also indicate a viral infection.
- Treatments are mainly supportive in nature. This can include administering fever reducers and allowing the animal to rest. Antiviral medications are being developed, but many are cost prohibitive. Antibiotics kill bacteria and have no effect on viruses.

Horses can be infected by at least four different papilloma viruses that cause warts.

* See slide notes for more information

Physical Exams

Physical Examination

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Vital Signs

- Before beginning the actual physical exam an animal's weight, temperature, heart rate, and respiration rate are taken.
- These base-line measurements indicate how an animal is functioning at the time of the exam and may be a first indication that something is wrong.

Physical Exam Findings

- Upon completion of the physical exam the Dr. is able to address chief complaints or abnormal findings.
- This may lead to diagnostic tests
 - Urine, blood, or fecal samples
 - Imaging: CT, X-ray, or ultrasound

VETERINARY TECHNICIAN & SCIENCE PARTNERSHIPS



PEER
Partnership for Environmental Education and Rural Health

ATM | TEXAS A&M UNIVERSITY

Science Resources for Middle and High Schools

Home | Teacher Resources | Request a Lesson Plan | Teacher Workshops | Videos | NSF GK-12 Program | For Veterinarians

The PEER website offers resources for Middle School Teachers:

- Mini-modules (one-class, self-contained lessons)
- Free CDs containing all of PEER's curricula
- Adventure-based health science story lessons that incorporate math, science, social studies, and language arts
- Veterinarians' Black Bag curricula
- Professional sessions across Texas
- Distance Learning Community
- Web curricula on life science and environmental health
- Visit <http://peer.tamu.edu> to take advantage of these resources!

