



Every year, millions of animals are dissected or killed in schools and universities on various grade levels. Cats, frogs, fetal pigs, grasshoppers, mink, earthworms, rats, mice, dogs, pigeons, and turtles are just some of the many species used. While most animals are purchased as dead specimens, many are subjected to painful and lethal procedures while still alive.

Over the past several decades, educators have begun to question the value of this use of animals. Now, teachers and

professors recognize that students can learn equally as well through the use of modern technology. There is also an important lesson taught when not using real animals; students learn to respect living beings and begin to appreciate and understand the role of animals in nature. This is fundamental to biology, *the science of life*.

### ANIMALS IN THE CLASSROOM

Students, ranging from elementary school to college, commonly dissect dead animals to learn about anatomy. In other cases, teachers, who most likely have no veterinary or animal care training, actually kill an animal after demonstrating her physiological functions. 'Pithing,' for example, involves the insertion of a sharp object into an animal's skull and moving it around vigorously to 'scramble' her brain. This is a common practice for rendering frogs and turtles 'brain-dead' for physiology experiments. In other cases, animals are anaesthetized, and some organs are removed while they are still alive. The animals are euthanized at the end of the lab. Other 'life' sciences that use animals include psychology, behavior, nutrition, and genetics.

Chick hatching is another common practice that often results in the neglect and death of the animals involved. Although it is meant to teach students about the process of embryonic growth, it instills a concept that animals are expendable objects to be born and bred for the convenience of humans. Furthermore, lack of proper care and attention to eggs during the incubation period can result in chicks suffering from horrific physical deformities or death. Once chicks are hatched and start growing into adults, the exercise is completed. Teachers then bear the burden of finding a home for the animals, and unfortunately, they likely will be placed somewhere inappropriate (i.e., with someone who does not know how to care for them or neglects them) or killed.

Students are also often encouraged to use live animals for science fair projects. These projects can include experiments involving physical pain or stress, psychological stress, surgical procedures, force-feeding, drug addiction, and/or radiation. Experiments are often wasteful and duplicative of past studies. They also involve students who have no training in the humane care, use, and handling of animals. Some science fairs have issued policies against student use of animals like Westinghouse Science Talent Search did in 1969; but others still encourage it.

### WHERE DO THE LIVE OR DEAD ANIMALS COME FROM?

It is estimated that 170 animal species or more are used for dissection or vivisection (to cut into a living being). The animals come from various sources such as: their natural habitat, animal breeders and dealers, pounds, shelters, ranches, and slaughterhouses. Live and dead animals are bought from these sources by biological supply companies—the companies from which educators purchase laboratory specimens. For instance, people who 'fish' will sell fish and sharks to biological suppliers. Cats and dogs, who have been euthanized in shelters or pounds or otherwise acquired by animal dealers, are also sold to suppliers.

Animals are also obtained as 'byproducts' of extremely cruel industries. For instance, slaughterhouses provide fetal pigs, and fur farms sell skinned mink, foxes, and rabbits. Most of these animals led deprived lives, and standards regarding humane slaughter or death are rarely enforced. Common methods of killing include: suffocation, anal electrocution, drowning, gas chambers, or euthanasia.

Because these animals are considered mere objects or products, the lack of quality care, handling, and treatment often leads to trauma, injury, or premature death. For example, live animals are often shipped in overcrowded packaging, which leads to injury, food deprivation, dehydration, and/or suffocation. These animals also can be exposed to extreme temperatures and rough handling.

In order to better assure that animals are obtained in a legal manner and cared for properly, some warm-blooded animals are protected under the United States Animal Welfare Act (AWA). The U.S. Department of Agriculture (USDA) is the federal agency that enforces the AWA. The AWA requires that animal dealers be licensed as Class 'A' or Class 'B' dealers and that facilities operated by these dealers be inspected by the USDA. Class 'A' dealers are animal breeders. Class 'B' dealers may also breed animals, but also purchase and re-sell live and/or dead animals. Class 'B' dealers procure animals in a number of different ways including from 'random sources,' such as the aforementioned sources which can include unclaimed 'stray' animals, 'free to a good home' ads, or former companion animals sold by some pounds or shelters.



Class 'B' dealers may sell these animals to companies such as biological supply companies (who are also considered Class 'B' dealers under the AWA definition). Most of the animals obtained for dissection are bought from biological supply companies. The largest ones carry over 100 different species of animals from horseshoe crabs to dogfish sharks, from snakes to mink, from embalmed dogs to skinned, pregnant cats.

## HUMANE SCIENCE EDUCATION

The primitive traditions of dissection and vivisection are not the only options available to educators of all grade levels who intend to instill scientific skills and analytical thought in their students. Innovative methods of teaching anatomy, physiology, behavior, genetics, molecular biology, and psychology are available in various formats for a variety of species.

The Science Bank catalog offered by Animalearn features over 100 products including 3-D cat, earthworm, fetal pig, and frog dissection CD-ROMS, a video of a sheep brain dissection, simulated frog muscle and nerve experiments, a king-sized human eye model, a fly genetics lab, and lessons for microsurgical techniques on a rat, among many others. Through innovative and cutting edge technology, students can learn about human physiology and anatomy in ways they otherwise could not by using real cadavers. In many cases, the models and simulations provide a more broad illustration of anatomy and physiology than would the dissection of cadavers or use of live animals. In all cases, they instill a respect for life.

## REASONS TO AVOID DISSECTION OR USE OF LIVE ANIMALS

### DESENSITIZATION

In these times, we need to avoid subjecting children to images of cruelty and unnatural and unnecessary death to the best of our ability. Studies have shown that there is a strong correlation between the ways in which we treat animals and the ways we treat fellow humans. Not surprisingly, many people feel a natural connection to and curiosity towards animals, as they are our companions at home and neighbors in the wild. In fact, humans are classified as animals. Students must understand how to treat others with compassion and respect, and teachers can provide excellent examples of humane and non-consumptive learning methods that are scientifically sound.

### THE ENVIRONMENT

A curriculum that promotes the natural roles of animals in their ecosystem and as individuals in the web of life presents a far more practical and accurate lesson in life science. The removal of animals from their natural habitats for use in classrooms can disrupt the ecosystem and sets a negative example for wildlife conservation and environmental protection—two vital concepts for future scientists.

Furthermore, chemicals used to preserve dead specimens, such as formaldehyde and formalin (diluted form of formaldehyde) are respiratory irritants, carcinogenic in humans, and environmental pollutants. Careless or irresponsible disposal of these preservatives or animal remains can contaminate water and soil and potentially harm wildlife.

### MONEY

Educators are often limited by budgetary concerns, and saving money can be a good selling point when trying to convince a superintendent of the benefits of not using live or dead animals. Proper care for live animals requires training and supplies that may be costly. The cost of purchasing tools and preserved cadavers (on an annual basis) for dissection adds up over time. A cost



comparison for a classroom using traditional animal dissections versus one using non-animal alternatives shows that thousands of dollars can be saved by using and re-using non-animal methods. For instance, making a one time purchase of tools and a three year supply of fetal pigs costs approximately \$3115. While purchasing a fetal pig dissection CD-ROM networked for 45 computers, a fetal pig model, and dissection video costs approximately \$2003. Humane educational materials saved \$1112.00.

### EFFICIENCY/TIME

Because of unpleasant odor, poor preservation, mutilated remains, or other factors, animal cadavers do not have a long shelf-life once dissected. By using a model or computer simulation, educators can avoid the time constraints often associated with anatomy units and allow students to learn and appreciate anatomy at a more appropriate pace. Models and simulations also provide consistent, clear images to all students using them. A field trip or video in which students can view animal behavior also takes less time than that required for caring for live animals.

## FREQUENTLY ASKED QUESTIONS

*Shouldn't students who plan to pursue a higher education in science or medicine learn to dissect before attending college?*

Many prestigious medical schools such as Harvard, Yale, and Stanford no longer use live animals to teach future doctors. Instead, they use modern technology and human cadavers—the most applicable way to learn human anatomy.

Some veterinary schools such as Tufts University School of Veterinary Medicine and Western Health Sciences University have found ways to incorporate compassionate and respectful ways to obtain cadavers for anatomy lessons and teach surgical skills without terminating the animals' lives. They have developed Educational Memorial programs in their hospitals in which clients can donate their deceased companion animal from whom students will learn.

Students can develop their manual and cognitive skills and the necessary confidence for a successful surgery by using models. When their skills improve, they can then observe and assist a licensed veterinary surgeon in the operating room until they are ready to act as the primary surgeon under supervision. This gives the real-life experience of an actual veterinary surgical procedure. Whereas, in terminal surgeries on healthy animals, in which students know that the animal will be euthanized before recovering from the surgery, students forgo wearing gloves and taking other necessary precautions required for a sterile, successful, and real-life surgery.

### *What's wrong with using animals who have been killed for other reasons?*

Seeing and cutting into dead animals who were once someone's companion can be very traumatic or otherwise difficult for students, especially if they find that the animal is pregnant. Use of animals from slaughterhouses, fur farms, or shelters and pounds neglects the greater problems of animal cruelty, why these animal lives have been wasted, and the animal overpopulation crisis. It instills a utilitarian view of animals, disregarding the study of life.

### STUDENTS' RIGHTS OPTIONS AND BANS ON DISSECTION IN THE CLASSROOM

In 1987, California student Jennifer Graham filed a lawsuit against her high school for insisting that she dissect a frog rather than being offered a viable non-animal alternative. Ms. Graham's victory in this case established a legal precedent that paved the way for future students to object to dissection.

Many primary and secondary students are aware that they may be required to dissect an animal at some point in their scholastic career. What many students and teachers are not aware of, however, is that not only do viable non-animal alternatives to dissection exist, but in some states laws have been enacted that protect the choice of a student not to dissect. These laws called Students' Rights Options guarantee that a student will not be discriminated against or penalized by their teacher or school for choosing an alternative to dissection. These laws enable students to refuse to participate or observe any classroom exercise that may involve dissection, vivisection, incubation, capture, or other activities that may harm or destroy animals. Currently, there are six states in the U.S. that have Students' Rights Options— California, Florida, Illinois, New York, Pennsylvania, and Rhode Island.

The same year that Ms. Graham was engaged in her lawsuit, Argentina became the first country to ban the use of animals for dissection. In 1994, Slovakia was the second country to ban dissection followed by Israel in 1999.



### DO LAWS EXIST TO PROTECT ANIMALS?

*(See also "Where do the live or dead animals come from?")*

It is often assumed that laws exist to protect animals such as state anti-cruelty laws, but in fact, many of the laws are either difficult to enforce and/or specifically exclude animals used for educational purposes. The Animal Welfare Act (AWA) is the main federal law intended to protect animals, but it does little to help the millions of animals used for dissection. According to the AWA, an animal is defined as any live or dead dog or cat or any warm-blooded animal (excluding birds, mice, rats, and animals used for the production of food or fiber) who is used for research, teaching, testing, or is a 'pet.' It excludes the millions of animals used for dissection, including sharks, rats, fetal pigs, earthworms, perch, frogs, and grasshoppers, to name just a few.

Because of the various exclusions, it is hard to ascertain the exact numbers and kinds of animals killed by dealers or breeders. Because the AWA only requires animal dealers to record data for the animals covered under the AWA, there are a large number of animals who are not included. Many animal dealers are also reluctant to divulge complete information to the government or animal protection organizations. As a result, only estimates can be made of the number of animals used for dissection. One reasonable estimate is that about six million vertebrate animals are dissected yearly in U.S. high schools alone, with an additional unknown number used in colleges and middle and elementary schools. The number of invertebrates dissected is probably higher than that of vertebrates, making the total number of animals used annually at a minimum of 13 million but possibly as high as 20 million.





## ALL GRADE LEVELS

### Explore your world!

Take your students to the local nature center or park. Observe squirrels, birds, geese, and/or other animals in their natural habitat.

### Project Pigeon Watch

This program which is based at Cornell University's Lab of Ornithology uses students, teachers, and other interested individuals to record the number of pigeons by color and courtship behavior. This is a great way to observe animals in their natural environment, develop statistical and analytical skills, and understand morphology and behavior. Participants receive a Research Kit and report their findings back to Cornell University. If you do not live in an area with pigeons, the ornithology lab also offers many other exciting 'Citizen's Projects.' (See Resources Section)

## PRIMARY LEVEL ACTIVITIES

- Do an activity pertaining to frogs. Show your students a film about frogs in nature. Ask the class to discuss the pros and cons of dissection and the ramifications of dissection for animals, for the environment, and for humans. Draw a food chain or web of life and examine how the removal of one species can effect the natural system.
- Have students do an activity from the book, *Backyard Safaris: 52 Year-Round Science Adventures* by Phyllis S. Busch.

### Geography

Explore the interdependencies between living beings in the areas and regions studied.

## FOLLOW-UP CURRICULAR ACTIVITIES

### Math

Ask students to draw a chart to calculate, generation by generation, the number of the offspring of cats or dogs who have not been spayed or neutered.

### English/Reading

Read *Puddles and Ponds: Living Things in Watery Places* by Phyllis S. Busch and *At the Frog Pond* by Tilde Michels. Discuss the importance of keeping wild animals where they belong, in nature.

### Geography

Explore the interdependencies among living creatures in the areas and regions you are studying.

## SECONDARY LEVEL ACTIVITIES

### Anatomy

#1  
External surfaces offer much to study. Many different systems are used in the invertebrate and vertebrate animal kingdoms to contain the body, such as exterior surfaces ranging from thick hides to single cell layers; or skin coverings such as fur, hair, and feathers. For instance, mountain gorillas have longer, thicker hair than gorillas living in lower (and less cold) elevations. Have your students think about what functions these different external surfaces serve. Are they for protection? Defense against predators? Heat regulation? Do they aid in flying? How are animals related to their environment? Ask students to do a comparative study of external surfaces.

#2  
Owl pellets are natural 'hair balls' left by owls after consuming their prey. Inside the pellets are hair and skeletal remains of various species such as voles, shrews, rats, and mice. Students can dissect the pellets and, by following charts and posters, piece together the skeleton. Students can then compare their skeletons to determine what species they have 'put together.' This lesson teaches predator-prey relationships, the food web, comparative anatomy, manual dexterity, and critical thinking.

Various lesson plans and activities can be built around this project. It is an exciting, hands-on, and non-consumptive way to learn about nature. (See Resources section for a company that sells legally-obtained owl pellets)

### Social Science

Students can conduct a survey into the attitudes towards dissection at their school. Do teachers differ from students? Do older teachers feel differently than younger students? Do females differ from males in their responses?

### Science

To discuss the structure and function of the human eye, invite an optometrist into your classroom. Also invite a human doctor and veterinarian, on the same day if possible, to discuss anatomy and comparative anatomy. Use models, videos, computer simulations, and charts as visuals.

### Math

Develop an understanding of geometric progression through calculating, generation by generation, the offspring of cats and dogs who have not been spayed or neutered and whose offspring are not spayed or neutered, which relates directly to dissection and animal overpopulation. You can also construct different models to demonstrate how spaying and neutering some of the animals can reduce overpopulation.

### Geography

Explore the interdependencies among living beings in the areas and regions studied. For example, primates and birds, who consume seeds or fruits with seeds, assist forest growth by spreading the seeds around. You can also analyze why two members of the same species differ according to their geographic home range.

## RESOURCES

### Reading Materials

- The AV Magazine "Dissecting Dissection" issue \*
- The Use of Animals in Higher Education*, by Jonathan Balcombe \*
- Animals in Education*, by Lisa Ann Hepner
- Vivisection and Dissection in the Classroom*, by Gary Francione and Anna Charlton \*
- From Guinea Pig to Computer Mouse*, INTERNICHE, [www.interniche.org](http://www.interniche.org)

### Websites

- Association of Veterinarians for Animal Rights, [www.avar.org](http://www.avar.org)
- Educational Memorial Programs, [www.educationalmemorial.org](http://www.educationalmemorial.org)
- International Network for Humane Education [www.interniche.org](http://www.interniche.org)
- Norwegian Inventory of Alternatives, <http://oslovet.veths.no/NORINA/>
- Psychologists for the Ethical Treatment of Animals, [www.psyeta.org](http://www.psyeta.org)

### Teaching Tools

- The Science Bank, Animalearn's free loan program for various humane education products \*
- The Frog Fact Kit, Animalearn \*
- Owl Pellets from Nature's Classroom, <http://www.owlpellets.com>
- Project Pigeon Watch, 1-800-843-BIRD, [www.birds.cornell.edu/ppw/](http://www.birds.cornell.edu/ppw/)

(\* available from Animalearn)



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