HUMANE EDUCATION

ANIMAL WELFARE INSTITUTE

HUMANE EDUCATION

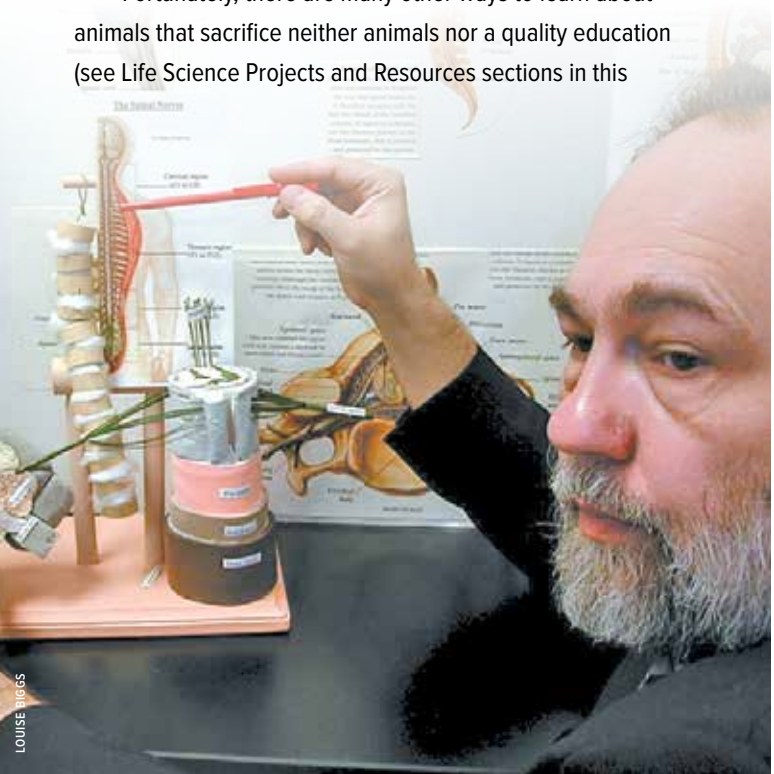
ANIMAL WELFARE INSTITUTE

BIOLOGY: THE STUDY OF LIVING BEINGS

Biology, with its rich diversity, is a fascinating field of discovery for all who study it. A teacher's ability to convey interesting and useful material to students can leave an indelible mark on their minds and encourage a lifelong interest in the life sciences. Students' respect and empathy for other living creatures should be appreciated and encouraged.

Traditional classroom animal dissections undermine these noble aims by harming animals and reinforcing the belief that humans are the only species of moral consequence. The killing of animals to learn anatomy is sustained not by educational merit but by economic interests and the inertia of tradition.

Fortunately, there are many other ways to learn about animals that sacrifice neither animals nor a quality education (see Life Science Projects and Resources sections in this brochure). A variety of alternative methods designed to replace dissection have actually been shown to provide superior learning outcomes for students. Other options include the study of animals in their natural habitats or establishing temporary habitats in the classroom to study smaller invertebrates found locally, such as worms and insects, whose habits are not as disrupted by captivity and who can be released following the classroom observations.



LOUISE BIGGS

DISSECTION'S HIDDEN COSTS

More than 12 million animals are used for dissection in the United States each year. Frogs are typically dissected in the primary and secondary grades, though cats, rats, fetal pigs, fish, and a variety of invertebrates are often used too. Dissection supply is a lucrative business, and large biological supply companies may offer up to 70 or more animal species for dissection in their product catalogs.

The procurement of animals for dissection causes unnecessary suffering and death. Investigations into the capture, transport, warehousing, and killing of animals destined for dissection have documented cruel and callous treatment. An estimated 20,000 to 50,000 cats are used for dissection each year and are obtained from ethically questionable sources—including inhumane shelter operations in Mexico. Frogs are captured by the millions, piled into sacks, and inhumanely killed by immersion in preservative.

Dissection is also ecologically unfriendly. Most of the animals are caught in the wild, which may disrupt their populations and the ecosystems where they live. For example, frogs play a crucial role in wetland habitats, both as consumers of insects and as food for bird, mammal, reptile, fish, and invertebrate predators. Amphibians are declining across the globe due to a variety of threats, including habitat destruction, pollution, climate change, disease, and collection for commercial use.

The formaldehyde used to embalm animals for dissection renders them as hazardous waste that must be discarded accordingly. Formaldehyde is a known carcinogen described by the US Occupational Safety and Health Administration (OSHA) as "highly irritating to the upper respiratory tract and eyes. ... Formaldehyde solutions splashed into the eye can cause injuries ranging from transient discomfort to severe, permanent corneal clouding and loss of vision." Formaldehyde exposure can also trigger asthma attacks, bronchitis, and severe skin irritation, and has been linked to cancer of the throat, lungs, and nasal passages.

The long-term economic cost for conducting dissections is higher than the cost for purchasing humane education alternatives such as software programs or models. A single preserved bullfrog costs between $13.25 and $21.50 and can only be dissected once. In contrast, computer simulations, 3-dimensional models, and other alternative materials are reusable and can last years. Schools, therefore, can save thousands of dollars in replacement and equipment costs. Several free lending library programs for dissection alternatives can eliminate costs entirely.

Finally, animal dissection reinforces the idea that humans are the only species that matters, and that other animals were put here for our use. School projects that harm animals may impair young people's emotional development by desensitizing them to the well-being of others, and by teaching them to rationalize and condone the unjustified killing of animals.

BETTER METHODS

There are myriad teaching tools available for use in the classroom that do not require the use of once-living animals. These include state-of-the-art computer programs, tablet and smartphone apps, 3-dimensional models, charts, and microscope slides for a range of animals, including humans. One very effective way for students to learn vertebrate anatomy and physiology is by building anatomical models. These can

DIGITAL FROG INTERNATIONL

Computer models are among the humane alternatives to dissection. Studies show these alternatives to be equal to or better than dissection in helping students learn.

be constructed from clay (for which base skeletal models are commercially available), polystyrene, or other materials.

One of the best-kept secrets about dissection alternatives is that they have been shown, time and again, to perform as well as, and often better than, animal dissections in student learning performance. A 2014 analysis of 36 published studies of alternatives used in secondary and undergraduate schools found that 15 studies showed equivalent student learning outcomes between animal-based and humane alternative methods, and 16 studies yielded superior learning outcomes for alternatives. Only five studies reported more favorable outcomes for animal-consumptive methods.

LIFE SCIENCE PROJECTS

A thorough knowledge of animal physiology gained through nonlethal study can be complemented with an understanding of animal behavior. Much can be learned about animal behavior by observation of companion animals or animals on small family farms, in sanctuaries, in the wild, or at zoos.

Here are just a few suggestions for independent study projects:

- Maintain a compost pile and study the invertebrates that live in it.


WILLAMETTE NATIONAL FOREST

- Examine play behavior, vocalizations, eating behavior, or other behaviors in your companion animal (a video camera is useful for detailed analysis).
- Observe birds at feeders. Which species feed together? How do different species feed? Put out different foods and monitor different preferences.
- Sample the soil in different habitats and, with the aid of a microscope, survey the invertebrates found there. How do different habitats compare? Different soil depths? Different seasons?
- Develop an ethogram—a complete behavioral repertoire of an easily observed species (e.g., squirrel).

RESOURCES

Alternatives databases: A valuable source of information on available alternatives.

- Norwegian Inventory of Alternatives (NORINA) *https://norecopa.no/norina*
- Humane Society Veterinary Medical Association (HSVMA) *http://alted.hsvma.org/*
- Dissection alternatives lending library programs
- The Science Bank *http://www.thesciencebank.org/*
- Biology Education Advancement Program (BioLEAP) *http://www.navs.org/additional-information/biology-education-advancement-program-bioleap/* or 800-922-FROG

US states with dissection choice laws or policies:
California, Connecticut, Florida, Illinois, Louisiana, Maine, Maryland, Michigan, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, and the District of Columbia. Note: Most schools will accommodate students who request alternatives. If your state doesn't have a dissection choice law, we also encourage you to contact your state legislators and ask them to sponsor one.

YOU CAN MAKE A DIFFERENCE

A message to teachers:
You have the right to offer your students biology education without harming animals. Sophisticated, stimulating, and cost-effective alternatives to dissection are available to educate without traumatizing. Ask your students about their preferences, discuss the issue with other teachers, and consider presenting the matter to your school board.

A message to students:
You have the right to learn without harming other living creatures. If you discover that you will be asked to dissect an animal in a class, talk with your parents. Let them know why you don't want to dissect. If your parents are supportive, ask them to write a letter to your teacher explaining why you wish to be given a different assignment. Talk to your teacher and request an alternative project such as making your own model. See if you can come up with an exciting project that will let your teacher know that you're genuinely interested in learning and not just trying to get out of a class assignment! Talk with other students—chances are you're not alone.

Animal Welfare Institute

Since 1951, AWI has been a leading voice for animals around the globe. Please join our efforts to reduce the suffering inflicted on animals by humans and sign up for AWI eAlerts to receive the latest news on what you can do to help us protect all animals: *www.awionline.org/joinus*.

FRONT: BRIAN E KUSHNER/BACK: SHANE WILSON

900 Pennsylvania Avenue, SE, Washington, DC 20003
(202) 337-2332 · *www.awionline.org*