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ABSTRACT

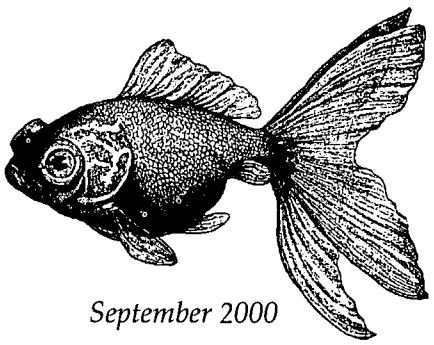
This document features a guide for elementary and secondary school teachers integrating animals into their curriculum and classrooms. Topics discussed include suitable classroom pets, care and housing, integrating the classroom pet into the curriculum, live animal studies, earthworms, dissections, science fairs, and resources. (YDS)

Animals in the Classroom: A Guide for Elementary and Secondary Educators

Elaine Birkholz
Peter Theran
Issues and Answers, September 2000

ISSUES & ANSWERS

FROM THE MSPCA's
CENTER FOR LABORATORY ANIMAL WELFARE



September 2000

Animals in the Classroom

A Guide for Elementary and Secondary Educators

Opportunities to explore the mysteries of life can be highly compelling and enriching experiences for elementary and secondary school students, increasing children's interest in and understanding of all forms of life.

Lessons in the life sciences can also foster respect for and connection with the animals with whom we share this planet if the principles of scientific inquiry are taught in humane ways, without causing pain, injury, stress, or suffering to any species.

This publication offers guidelines for helping students develop responsible attitudes toward animals through contemporary teaching practices at the elementary and secondary level.

Classroom Pets

Interacting with live animals can help children develop compassion, respect, and responsible behavior. As a teacher, you can promote these attitudes by demonstrating a commitment to the humane care of classroom pets and by integrating activities with them into the class curriculum.

Classroom pets can, in fact, help students learn far more than the habits and needs of their species. They can also help develop observation and listening skills and serve as a catalyst for math, science, language, history, and geography lessons (see sidebar) — but it is important to plan carefully before acquiring a pet for your classroom.

Although they spend most of their time in school, classroom pets are the long-term responsibility of the teacher. Their success or failure depends upon your commitment to meeting their physical, behavioral, nutritional, and medical needs. The following considerations can help you make a good decision about entering into this commitment of time, effort, and money.

The success or failure of a classroom pet depends on your commitment to meeting its physical, behavioral, nutritional, and medical needs.

Suitable Classroom Pets

Not all animals adapt well to classroom life. Those that generally do well are hardy, able to thrive in captivity, enjoy habitats that can be readily duplicated in the classroom, are able to withstand the temperature range and other environmental features of school buildings, and are fairly simple to care for. These include freshwater fish (goldfish are hardiest), insects, and small rodents such as gerbils, mice, rats, and guinea pigs that are relatively tolerant of handling. Some animal shelters can be good sources of small, friendly animals able to adapt to the rigors of the classroom environment under the supervision of responsible teachers. Ant farms can also be fascinating, and they are easy to maintain.

Rabbits have more complex requirements—including the need for daily exercise out of the cage and an urge to chew, which requires rabbit-proofing the classroom—that make them less suitable as classroom pets for some teachers. Hamsters are not recommended because they are nocturnal and will want to sleep just when your class wants to enjoy them. Farm animals do best outdoors.

Most reptiles and amphibians require special environments and care, and they should not be kept as pets by teachers unprepared for this responsibility. Turtles, snakes, and lizards (including iguanas) can also carry salmonella, which poses a serious health risk to humans. The classroom offers a less-than-ideal environment for most birds because they are subject to drafts and susceptible to stress. They can also be noisy and disruptive.

Wild animals never make good classroom pets. Most adapt poorly to the classroom. They require very specialized care, and keeping them in captivity can encourage students to take wild animals into their own homes, which can result in disastrous consequences.

Before bringing any animal into the classroom, you should learn about its care, and you should research all applicable state and local laws governing the use of animals in schools.

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Several states — including Massachusetts, Connecticut, New Hampshire, Maine, Florida, and California — have passed specific laws governing the use of animals in the classroom and at science fairs.

Care and Housing

Keeping animals in the classroom requires a commitment of time, effort, and money on your part. Regular maintenance includes keeping cages and tanks clean and providing fresh food and clean drinking water. Housing must allow each animal enough room to move around and escape the attention of students and of other animals in its enclosure. It must be secure enough to prevent the animals' escape.

Give careful thought to the location of the animals in the classroom. Enclosures must be well ventilated and provide protection against extremes of heat and light. Glass enclosures, which can overheat easily, should be located away from direct sunlight. Wire cages, which are subject to drafts, should be located away from windows and heating and air conditioning units. Wire cages should also be checked for any protruding wires that could injure the animal or a child.

Appropriate food, bedding, and gnawing material (for rodents) must be provided. Many rodents enjoy nest boxes (cardboard boxes with an entrance cut out) and tunnels (paper towel tubes work well). Exercise equipment and toys designed to enrich the environment of caged animals should be made available.

Periodic handling is good for some species, but students should be taught carefully how to pick up, hold, and touch their classroom pet to minimize the risk of escape or injury. Only those students mature enough to handle the animal appropriately should be allowed this privilege, and they should always be carefully supervised. Most classroom pets that bite do so because human hands have become associated with unpleasant experiences. No stressful or harmful procedures must ever be allowed on a classroom pet.

As your classroom pet's primary caregiver, you are best qualified to meet its needs, so if the pet can leave the classroom it is best if it goes home with you over weekends, holidays, and vacations. Changes in its care and environment can severely stress some animals that are sent home with students, and their safety can be jeopardized due to untrained or careless handling and the presence of other pets or young children in the student's household.

If you decide to entrust the temporary care of your pet to a student and his or her family, detailed written instructions regarding safe transportation, feeding, and handling can prevent some problems.

Think carefully about the temperature requirements of any animals you cannot take home with you during periods when heat and air conditioning may be reduced. Ask to be notified in the event of any heat loss emergencies, and advise the fire department of the location of live animals in the building in advance of any emergencies.

Integrating the Classroom Pet Into Your Curriculum

If you decide that you are ready to take responsibility for a classroom pet, there are many ways to integrate it into your classroom activities to help your students develop compassion, respect, and responsible attitudes toward animals. Here are just a few ideas:

• Trace the history of your classroom pet's species, and use this as a catalyst for a geography lesson. When and why was this animal domesticated? Where was its native country? Are its relatives still found wild there? Does it have wild counterparts in this country? What are the countries of origin of your students' pets at home?

• Practice observation skills by assigning each child a certain block of time to watch the classroom pet and record its actions. Then have the group combine their findings to illustrate certain behavior patterns. Students can graph the time the animal spends in different behavioral categories such as feeding, grooming, sleeping, and playing. Find out why your pet acts as it does by consulting animal behavior books from the library.

Steve Gilbert

Integrating the classroom pet into your class activities can help your students develop compassion, respect, and responsible attitudes toward animals.

• Ask the children to speculate as to how the classroom pet feels about its situation. This speculation can then be recorded in stories written from the animal's point of view. Some examples might be "What Whiskers thinks about fourth grade," "Whiskers's favorite person," or "What Whiskers does when the class goes home."

• Use your classroom pet as a model for an art lesson. Drawings, paintings, or clay sculptures of this special member of the class will make nice remembrances for the children and will help them to share what they are learning about their special pet with their family and friends.

• Keeping any pet generally becomes more expensive than the owner had realized. Help the students understand the expense of owning an animal by having them draw up a "pet care budget" for your classroom pet. Make sure they consider costs of food and food supplements, bedding, housing, veterinary expenses, toys, and any special equipment. — from "The Classroom Pet: Delight or Disaster," by Kathy Savesky.

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Identify an alternate caregiver — such as another teacher, a mature student, a member of the office staff, or a local animal control officer— who is willing to provide temporary care if you are unavailable or if inclement weather forces school closings. Identify this caregiver on your lesson plans for substitute teachers.

If more than one animal is kept in the same cage, they should be behaviorally compatible and of the same sex. Female mammals often do better in group housing situations than males do because they may be less territorial and less likely to fight and cause injuries. It is always best to seek advice on this issue before creating a situation you will later regret.

Breeding small mammals such as mice or rats is not recommended because populations of these and other domestic animals are already abundant. Mealworms, crickets, and fruit flies make great subjects for lessons in reproduction.

Regular, preventative veterinary care should be provided for all animals kept in the classroom. This is not only important for the animals; it also sends a good message to your students about the importance of routine medical care. Before you acquire a classroom pet, be sure there is a veterinarian in your area who is knowledgeable about the care of that particular species. If euthanasia becomes necessary, it should be performed only by a veterinarian or by a trained technician in a local animal shelter.

Live Animal Studies

The MSPCA's Center for Laboratory Animal Welfare urges teachers to limit their elementary and secondary school study of live animals to the observation of normal living patterns, behavior, development, and relation to the environment.

Observational methods offer myriad opportunities for engaging curious young minds in scientific inquiry at all levels of education (see sidebar). The best approach allows students to observe animals in their natural habitat, but zoos, gardens, and aquaria offer good opportunities to observe animals in a captive environment. Students can also be encourgaed to observe normal living functions of pets, fish, or other domestic animals, including classroom pets; to observe the normal growth and development of humans and other animals; and to observe human behavior and physiology, such as monitoring pulse rates and blood pressure.

If you are considering using animals in a particular area of study, first consider whether your objectives can be met without actually bringing them into the classroom. Alternatives include books, films, videotapes, models, video discs, CD-ROM programs, the Internet, guest speakers, and field trips. Some zoos and museums also offer animal visitation programs. These can be good ways to introduce children to animals without the time and expense involved in acquiring them yourself.

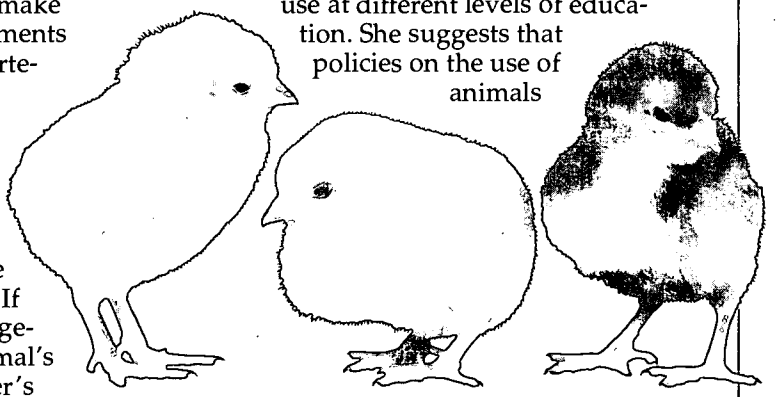
If you decide to bring live animals into your classroom, think carefully about the most appropriate species. Invertebrates with no nervous systems or those with primitive ones (including protozoa, worms, and insects) are preferable to more complex organisms for studying many life processes. Studies of vertebrates and invertebrates with advanced nervous systems such as snails should be used only when lower invertebrates are not suitable.

Teachers should make advance arrangements for placing all vertebrates (including fish, reptiles, amphibians, and small mammals) in permanent, suitable homes at the end of the study. If permanent arrangements for an animal's care in the teacher's home or elsewhere cannot be made, the animal should not be acquired for classroom use in the first place. Domestic animals should never be released into the wild under any circumstances.

Of particular concern to animal-protection professionals is the popular egg-hatching project. Even in the most responsible classrooms, incubator malfunctions can result in dead or deformed chicks. Others grow sick because their exacting needs for heat, humidity, and egg rotation are not met during and after hatching. Moreover, it is nearly impossible to find a suitable home for the resulting chicks. Most working farms will not receive school-project birds, and those that do will rarely accept roosters. Simply killing the chicks after birth promotes the idea that these animals are disposable commodities. Recommended alternatives include a trip to a chick hatchery or the purchase of a butterfly hatching kit (be sure the species are native to your area).

No vertebrate animals should be used in biological or behavioral experiments in pre-college education that cause pain, injury, stress, or suffering, or interfere in any way with the animal's normal development, health, behavior, or environment. As a general rule, procedures that cause pain, injury, stress, or suffering in humans also cause pain, injury, stress, or suffering to other vertebrates.

F. Barbara Orlans, Ph.D., senior research fellow at the Kennedy Institute of Ethics at Georgetown University, offers some sound advice for thinking about animal use at different levels of education. She suggests that policies on the use of animals



A trip to a chick hatchery or the purchase of a butterfly hatching kit is recommended over the use of classroom incubators.

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Earthworms Make Good Science and Foster Respect for Life

The following excerpt from National Science Education Standards, published by the National Academy Press, offers just one example of the exciting learning environment that can be created when teachers combine good science with an effort to foster respect for living things.

While studying a vacant lot near school, several of Ms. F.'s third-grade students become fascinated with earthworms. Although she had never used earthworms in the science classroom before, and she knew she could use any of a number of small animals to meet her goals, Ms. F. felt she could draw from her experience and knowledge working with other small animals in the classroom.

She called the local museum of natural history to talk with personnel to be sure she knew enough about earthworms to care for them and to guide the children's explorations. She learned that it was relatively easy to house earthworms over long periods. She was told that if she ordered the earthworms from a biological supply house, they would come with egg cases and baby earthworms and the children would be able to observe the adult earthworms, the egg cases, the young earthworms, and some of the animal's habits.

Before preparing a habitat for the earthworms, students spent time outdoors closely examining the environment where the worms had been found. This field trip was followed by a discussion about important aspects of keeping earthworms in the classroom: How would students create a place for the earthworms that closely resembled the natural setting?

An earthworm from outside was settled into a large terrarium away from direct sun; black paper was secured over the sides of the terrarium into which the children had put soil, leaves, and grass. A week later the earthworms arrived from the supply company and were added to the habitat.

Ms. F. had been thinking about what she wanted the children to achieve and the guidance she needed to give. She wanted the students to become familiar with the basic needs of the earthworms and how to care for them. It was important that the children develop a sense of responsibility toward living things as well as enhance their skills of observation and recording. She also felt that her third graders would be able to design simple experiments to help them learn about some of the earthworms' behaviors.

In the first 2 weeks, the students began closely observing the earthworms and recording their habits. They noted what the earthworms looked like, how they moved, and what the students thought the earthworms were doing. The students described color and shape; they weighed and measured the earthworms and kept a large chart of the class data, which provoked a discussion about variation. They observed and described how the earthworms moved on a surface and in the soil. Questions and ideas about the earthworms came up continually. Ms. F. recorded these thoughts on a chart, but she kept the students focused on their descriptive work.

Then Ms. F. turned to what else the children might want to find out about earthworms. Among the many questions on the chart were: How do the earthworms have babies? Do they like to live in some kinds of soil better than others? What are those funny things on the top of the soil? Do they really like the dark? How do they go through the dirt? How big can an earthworm get?

Ms. F. let all the questions flow in a discussion, and then she asked the students to divide into groups and to see if they could come up with a question or topic that they would like to explore. When the class reconvened, each group shared what they were going to explore and how they might investigate the topic. The students engaged in lively discussion as they shared their proposed explorations. Ms. F. then told the students that they should think about how they might conduct their investigations and that they would share these ideas in the next class.

A week later, the investigations were well under way. One group had chosen to investigate the live cycle of earthworms and had found egg cases in the soil. While waiting for baby earthworms to hatch, they had checked books about earthworms out of the library. They had also removed several very young (very small) earthworms from the terrarium and were trying to decide how they might keep track of the growth.

Two groups were investigating what kind of environment the earthworms liked best. Both were struggling with several variables at once — moisture, light, and temperature. Ms. F. planned to let groups struggle before suggesting that students focus on one variable at a time. She hoped they might come to this idea on their own.

A fourth group was trying to decide what the earthworms liked to eat. The students had been to the library twice and now were ready to test some foods.

The last two groups were working on setting up an old ant farm with transparent sides to house earthworms, because they were interested in observing what the earthworms actually did in the soil and what happened in different kinds of soil.

In their study of earthworms, Ms. F.'s students learned about the basic needs of animals, about some of the structures and functions of one animal, some features of animal behavior, and about life cycles. They also asked and answered questions and communicated their understandings to one another. They observed the outdoors and used the library and a classroom well equipped to teach science. — National Science Education Standards, pp. 34-35.

should relate the educational level of the student to the justification for inflicting pain or death on a sentient animal. Beginners should start with projects that do not involve any ethical costs. At the primary and secondary school level, projects should not involve any harm to vertebrate animals. Guidelines issued by the National Science Teachers Association (NSTA) also discourage harmful experimentation on live animals at the pre-college level.

Procedures with the potential for causing pain or suffering to a vertebrate animal should always be conducted by highly trained scientists in carefully regulated settings where alternatives have been thoroughly exhausted, pain-killers are readily available, and the potential for new knowledge is great. No animals should ever be made to suffer for the purpose of demonstrating well-known facts.

Specific procedures to be avoided at the elementary and secondary level include any kind of surgery — with or without anesthesia; experiments that involve significant manipulations of the animal's environment, including lighting, temperature, diet, and housing; experiments that involve exposure to diseases, harmful radiation, toxic chemicals, carcinogens, pollutants, alcohol, harmful drugs, toxic fumes, electric shock, or excessive noise; behavioral or physiological studies that involve negative reinforcement techniques or deprivation (such as food or water); exercise until exhaustion; chick embryology experiments; and collection and killing of insects for display or identification purposes. Behavioral studies should be based only on positive reinforcement (rewards), not negative reinforcement (punishment).

Ideas for humane science experiments that encourage students to develop a life-long respect for life while learning good science abound. Some sources of ideas are listed at the end of this publication.

Dissection

In considering the dissection of preserved animals, first examine your teaching objectives, the need and relevance of such activities, and the age and maturity level of your students to determine if dissection is, indeed, the best course of action.

You must weigh the benefits of dissection against its ethical and environmental costs. Many concerned educators fear that students can become desensitized to the value of life in general when animals are killed for classroom use. In addition, if amphibians are wild-caught, their capture from the wild can deplete native species at a time when worldwide populations are declining.

Paula Abend

A wide variety of alternatives to dissection is available to teachers and students today.

Methods of capture, confinement, and transfer can cause intense suffering. A 1993–94 investigation by the World Society for the Protection of Animals uncovered cases of extreme cruelty in the killing and preservation of a large number of cats—many of them stolen pets—being collected in Mexico for shipment to U.S. biological supply houses. Similar problems occur with the capture of frogs and other species collected for the dissection trade.

Increasing numbers of veterinary and medical schools are replacing the use of whole animals with the study of computer simulations, plastic organ models, and animal tissues obtained from grocery stores and slaughterhouses. Other options include reducing the number of specimens needed for dissection through teacher demonstrations, group projects, and substituting a variety of invertebrates.

If you choose to include dissection in your biology curriculum, you can maximize its educational benefits by insisting that students show the highest respect for the animals provided and by offering equally valid alternative activities for students not wishing to participate in the dissection exercise. Your students' sincere concerns should always be treated respectfully.

Science Fairs

Learning proper experimental design and developing a respect for all of life can contribute to a deeper understanding of our world. Projects that promote greater understanding of an animal species and/or its relationships with other species can be of tremendous interest and value.

Sadly, the history of science fairs in America is replete with incidents of extreme cruelty to animals by young, untrained students. To prevent these from recurring, the Westinghouse Science Talent Search now prohibits all live vertebrate experiments except those involving behavioral observation, blood or tissue research, and data analysis. Despite some recent tightening of its rules covering research on nonhuman vertebrate animals, however, the International Science and Engineering Fair still allows projects that involve painful procedures on vertebrates.

The MSPCA's Center for Laboratory Animal Welfare believes that capable students wishing to study animals for a science fair project can achieve their educational goals and produce award-winning work without performing invasive experiments.

Students planning to conduct a study involving live animals should submit their plans in writing to an appropriate review committee

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before beginning the project or obtaining the animals. The written plan should include a detailed description of the methods and procedures to be used, including experimental design; data analysis; all aspects of animal procurement, care, housing, and use; and a plan for the care of the animal following the end of the study.

All projects must be directly supervised by a qualified teacher, who should assist the student in selecting a project consistent with his or her level of comprehension, ability, and maturity.

If any of the work is to be done outside of school, a parent or guardian should be asked to co-sign the project proposal, signifying an understanding of acceptable and unacceptable procedures, of the proper care and handling of any animals involved, and of their responsibility to supervise the work being done.

Pre-college students working with a mentor in a hospital or research laboratory setting should follow the same guidelines that apply to teachers and other students at the elementary and secondary level. No procedures should interfere with the animal's health and well-being. No painful procedures should be performed, and no toxic chemicals should be administered. No vertebrate animals should be sacrificed for student research. Students intending to conduct independent research at the mentor's institution must seek the approval of that institution's Institutional Animal Care and Use Committee (IACUC).

To avoid the potential for harm in transporting and housing animals in temporary quarters during science fair exhibitions, no living vertebrates should be used in displays at science fairs. Suitable substitutes for documenting behavior may include photographs, drawings, videotapes, audiotapes, charts, and graphs.

Animal Care and Use Committees

The MSPCA's Center for Laboratory Animal Welfare recommends that each school or school district establish an Animal Care and Use Committee (ACUC) to assist teachers, students, and parents in complying with these guidelines. The ACUC can be charged with reviewing the management of classroom pets, plans for classroom activities involving animals, and proposed science fair projects. The ACUC can ensure that all animals used are well cared for and not harmed in any way.

The National Academy of Sciences suggests that members of ACUCs be appointed by the school principal and include a science teacher, a teacher of a non-science subject, and a scientist or veterinarian. Other contributors could include a student, a school administrator and/or a parent. At least one panel member should not be affiliated with the school or science fair, and none should be family members of the student whose science fair or independent project is being reviewed.

For More Information

"Guidelines for Responsible Use of Animals in the Classroom," and "Responsible Use of Organisms in Precollege Science," National Science Teachers Association (NSTA), 1840 Wilson Blvd., Arlington, VA 22201, 701-243-7100, http://www. nsta.org/handbook/.

"Principles and Guidelines for the Use of Animals in Precollege Education," Institute of Laboratory Animal Resources (ILAR), National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418 (2000), or click on the "search" button at http://nationalacademies.org/ and key in the name of the publication.

Animal Care from Protozoa to Small Mammals, F. B. Orlans, Addison-Wesley Publishing Co., South Street, Reading, MA 01867, 800-552-2259 (1977), $24.22, ISBN #0201054841.

"Caring for Animals—A Guide for Teachers, Early Childhood Educators, and Students," Learning Media Ltd., P.O. Box 3293, Wellington, New Zealand 6001 ($8.95).

"Developing Empathy and Responsibility in Students for Animals and the Environment, Grades Pre-Kindergarten to Twelve," United Federation of Teachers Humane Education Committee, 76 pages (260 Park Avenue South, New York, NY 10010, 212-410-3095) (1992), or go to http://www.uft.org/humane/.

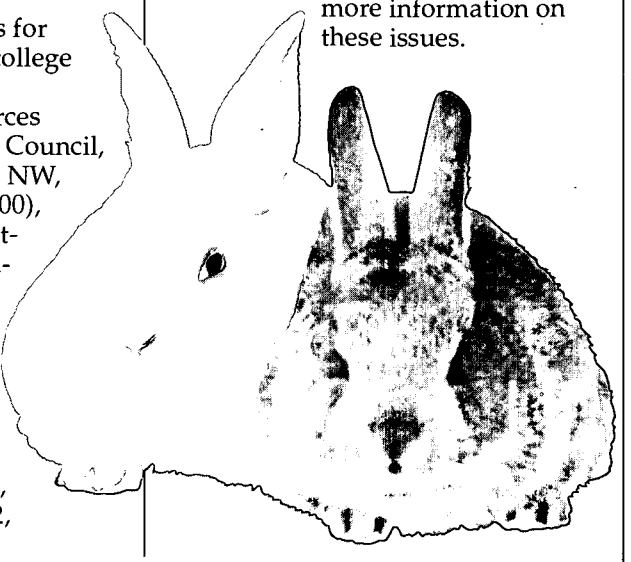
In the Name of Science: Issues in Responsible Animal Experimentation, F. B. Orlans, Oxford University Press, New York, NY (1993).

National Science Education Standards, National Academy Press, 2101 Constitution Ave., NW, Box 285, Washington, DC 20055, 800-624-6242 (1996), http://www.nap.edu/.

"Beyond Dissection: Innovative Tools for Biology Education," Sandra Larson, ed., Ethical Science & Education Coalition, 333 Washington Street, Suite 850, Boston, MA 02108 (1998), 617-367-9143, http://www.neavs.org/esec.html/.

Virtual Frog Dissection Kit, Version 2.0, http://george.lbl.gov/ITG.hm.pg.docs/dissect/info.html/.

Massachusetts teachers, students, and parents are encouraged to call the MSPCA directly for more information on these issues.



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