

CUTTING OUT DISSECTION:

Benefits of Non-Animal Teaching Methods

TeachKind
SCIENCE



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INTRODUCTION

Every year in the United States, an estimated 20 million animals are used for educational purposes.¹ These animals are obtained from a variety of sources and suffer immensely as a result of being trapped, transported, confined, experimented on, and killed for classroom science exercises.

Millions of frogs, for example, are captured in their natural habitats every year and killed for dissection or used while still alive in classroom biology experiments. The U.S. Department of the Interior has even stated that declines in amphibian populations can be attributed in part to the use of amphibians in dissection.² Biological supply companies obtain fetal pigs used for dissection from slaughterhouses; the fetuses are cut out of the bodies of pregnant sows who are slaughtered for meat. These companies also purchase stray, lost, and abandoned cats from animal shelters or “bunchers”—dealers who illicitly obtain animals from backyards and the streets of the United States and Mexico. Millions of other animals such as mice, rats, and rabbits are bred at facilities that cater to businesses and schools that use animals in classroom experiments and laboratories.

Fortunately, educators can help prevent this suffering *and* enhance students’ learning experience by using the modern, life-affirming, educationally effective non-animal teaching methods that are discussed in this informational brief.

EDUCATIONAL EFFICACY OF NON-ANIMAL TEACHING METHODS IN SCIENCE EDUCATION

Non-animal teaching methods—such as interactive computer programs, high-quality videos, and lifelike models—have inherent educational advantages over the use of animal laboratories for science education, translating into superior student outcomes.

Unlike dissection or live-animal laboratories in which students have just one opportunity to perform a procedure and learn the requisite content, non-animal methods allow students to repeat the material until they are proficient and confident without the distraction of mutilating or harming an animal. Furthermore, many software programs include modules that demonstrate how the living body works, side-by-side comparative anatomy modules, and content about ecology and behavior, none of which can be taught by dissecting an animal cadaver.

Because of these and other advantages, nearly every peer-reviewed comparative study published has concluded that the educational outcomes of students who are taught basic and advanced biomedical concepts and skills using non-animal methods are equivalent or superior to those of their peers who use animal-based laboratories.³ One systematic review concluded that students taught using non-animal methods demonstrated “superior understanding of complex biological processes, increased learning efficiency, and increased examination results.”⁴ It also reported that students’ confidence and satisfaction increased, as did their preparedness for laboratories and their information-retrieval

and communication abilities. Three recent studies at universities across the United States found that students who modeled body systems out of clay were significantly better at identifying the constituent parts of human anatomy than their classmates who performed animal dissection.^{5,6,7} Another study found that students preferred using clay modeling over animal dissection and performed just as well as their counterparts who dissected animals.⁸

In 2022, authors of a systematic review comparing student learning outcomes showed that in 95% of studies, students at all educational levels performed as well as or better than those who dissected animals.⁹

The use of non-animal teaching methods also improves the preparedness of students who are pursuing careers in the medical professions by better reflecting the teaching methods that they can expect to encounter in graduate school. All U.S. and Canadian medical schools—including such prestigious institutions as Harvard, Yale, and Stanford universities—have discontinued the use of animals to teach medical students, and no U.S. medical schools expect or require students to have participated in animal dissection.¹⁰ Furthermore, the American Medical Student Association (AMSA), the oldest and largest independent association of physicians-in-training in the United States, states that it “strongly encourages the replacement of animal laboratories with non-animal alternatives in undergraduate medical education.”^{11,12} Today, one can become a board-certified surgeon without ever having cut into an animal—alive or dead.

ECONOMIC BENEFITS AND EFFICIENCY OF NON-ANIMAL TEACHING METHODS

Non-animal teaching methods benefit educators by increasing teaching efficiency and lowering costs while affording enhanced potential for the customization and repeatability of teaching exercises.

Studies have shown that computer-based teaching methods “saved academic and nonacademic staff time ... were considered to be less expensive and an effective and enjoyable mode of student learning [and] ... contributed to a significant reduction in animal use”^{13,14,15} because there are no obligatory safety lessons, no set-up or clean-up time, and no monitoring of misbehavior with animal cadavers, scissors, and scalpels. With software and other non-animal methods, there is also no expensive disposal of equipment or hazardous-material removal. Some programs also allow educators to customize lessons and include built-in test and quiz modules that can track student performance.

Furthermore, animals (whether dead or alive) can be used only once, while non-animal resources can be used for many years—an added benefit that could result in significant cost savings for teachers, school districts, and state educational systems. For example, a site license for the popular eMind Cat software, which includes assessments and lab practicals, costs \$209 per year, while the cost of setting up cat dissection for 300 students over a period of five years can add up to \$7,178.

PETA's cost comparison shows similar cost savings for other species as well.¹⁶ PETA has also worked with eMind, SynDaver, and other companies to make discounts on their educational products available. Some programs, like Digital Frog 2.5, are completely free and available online. Video demonstrations of select programs, discount codes, and a comprehensive list of available products can be found at [PETA.org/Dissection](https://peta.org/dissection).

ETHICAL CONSIDERATIONS AND STUDENT PERSPECTIVE

Concern for animal welfare is at the root of most students' objections to animal dissection. Research has shown that many students at all stages of their educational careers are uncomfortable with the use of animals in education and experimentation. Furthermore, exposing young people to animal dissection as "science" can foster a callousness toward animals and nature and can even dissuade some from pursuing careers in science.^{17,18,19} According to Gallup polls, between 2001 and 2013, the number of young people opposed to animal testing rose from 31 percent to 54 percent.²⁰ Studies have shown that many students are reluctant to express their objections to participation in animal dissection, perhaps out of fear of real or perceived punishment or ostracism by their teachers and peers, and many do not speak up.^{21,22} For this reason, educators must clearly convey the message that students need not compromise their personal beliefs in order to learn science.²³ Replacing dissection opens the door to a new generation of students who can approach science from a humane perspective.²⁴

Many teachers are also opposed to animal dissection in the classroom, citing health and safety concerns, classroom management, learning and retention issues, cost, and the inability to justify killing animals for it.²⁵

ENDORSEMENT OF NON-ANIMAL METHODS BY SCIENTISTS, EDUCATORS, AND LEGISLATORS

To reflect technological advances, robust findings about the educational efficacy of non-animal teaching methods, and growing ethical concerns, the National Science Teachers Association (NSTA) amended its official position statement to acknowledge the educational effectiveness of non-animal teaching methods and to support teachers' decisions to use them as complete replacements for animal dissection.²⁶

NSTA and the National Association of Biology Teachers²⁷ advise teachers to be responsive to students' objections to harming animals by making humane alternatives available upon request.

In the United States, 17 states and the District of Columbia have enacted dissection-choice laws or policies that allow students in grades K–12 to opt out of dissection and require teachers to provide non-animal assignments. California,²⁸ Connecticut,²⁹ D.C.,³⁰ Florida,³¹ Illinois,³² Louisiana,³³ Maine,³⁴ Massachusetts,³⁵ Michigan,³⁶ New Hampshire,³⁷ New Jersey,³⁸ New Mexico,³⁹ New York,⁴⁰ Oregon,⁴¹ Pennsylvania,⁴² Rhode Island,⁴³ Vermont,⁴⁴ and Virginia⁴⁵ all have statewide laws or

department of education policies that allow students to opt out of animal dissection in favor of a non-animal method. In addition, other states—including Arizona,⁴⁶ Hawaii,⁴⁷ Minnesota,⁴⁸ Texas,⁴⁹ and Utah⁵⁰—have more general policies on allowing students to opt out of material that they find objectionable on moral, religious, or ethical grounds. Many school districts, universities, and secondary schools have policies in place. As of 2016, 63 percent of U.S. students in public schools could opt out of dissection.⁵¹

In a 2022 teacher survey, authors found that most educators believe that alternatives can be used to meet the biology-related learning objectives that have been traditionally associated with animal dissection. The perceived benefits of the hands-on experience that comes with animal dissection do not outweigh the harm to animals used in these exercises.⁵² For teachers who place value on providing their students with hands-on dissection experiences, dissectible synthetic models such as SynFrog offer a realistic dissection experience with none of the negative effects associated with dissecting once-living animals.

A majority of Canadian provinces—including Alberta, Manitoba, New Brunswick, the Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Québec, Saskatchewan, and Yukon—have similar policies and practices, and their curricula support the use of non-animal methods. See this interactive map for a list of U.S. and Canadian policies on dissection:

<https://features.peta.org/dissection-kills/dissection-laws.aspx>.

CONCLUSION

Replacing the use of animals in education with one or more of the many non-animal teaching methods available today offers numerous benefits, including reducing the number of animals who are captured in the wild or bred to be killed for dissection, providing students with a more effective and inclusive learning experience, encouraging students to show respect for animals and nature, and conserving the valuable resources of schools and their educators.

We encourage you to visit PETA.org/Dissection for video demonstrations of virtual-dissection software, discount codes for educational software, resource lists, and information about PETA's pilot program that provides teachers and schools with non-animal dissection materials. PETA also offers online training sessions in non-animal dissection for science education majors and teachers. Please pass along this information to your colleagues, and contact PETA if you have any questions or comments.

Inquiries can be directed to Info@teachkind.org.

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- ³⁹2005 New Mexico Board of Education Policy.
- ⁴⁰New York Education Law §809(4) (1994).
- ⁴¹Oregon Revised Statutes §337.300.
- ⁴²24 Pennsylvania Consolidated Statutes §15-1522 (1992).
- ⁴³Rhode Island Statutes §16-22-20 (1997).
- ⁴⁴16 Vermont Statutes Annotated §912.
- ⁴⁵Virginia Code Annotated §22.1-200.01 (2004).
- ⁴⁶Arizona Revised Statutes 15-102. This statute states, in part, that "[p]rocedures by which parents who object to any learning material or activity on the basis that it is harmful may withdraw their children from the activity or from the class or program."
- ⁴⁷Hawaii Department of Education Regulation 2210.1. This controversial issues regulation states, in part, that schools shall "[p]rovide a means through which and deadline by which parents and legal guardians may contact instructional staff or school administrators to exclude their child from the specific lesson or activity."
- ⁴⁸Minnesota Statutes §120B.20 (2012).
- ⁴⁹Texas Education Code 26.010. This code reads, in part, that parents may remove students "temporarily from a class or other school activity that conflicts with the parent's religious or moral beliefs if the parent presents or delivers to the teacher of the parent's child a written statement authorizing the removal of the child from the class or other school activity."
- ⁵⁰Utah Administrative Code R277-105-5. This administrative code states, in part, that "[a] parent, a legal guardian of a student, or a secondary student may request a waiver of participation in any portion of the curriculum or school activity which the requesting party believes to be an infringement upon a right of conscience or the exercise of religious freedom."
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