

Date of Hearing: May 1, 2019

ASSEMBLY COMMITTEE ON EDUCATION
Patrick O'Donnell, Chair
AB 1586 (Kalra) – As Introduced February 22, 2019

SUBJECT: Pupil instruction: animal dissection

SUMMARY: Prohibits students enrolled in public or private schools from dissecting, and viewing the dissection of, animals in the study of biological sciences. Specifically, **this bill:**

- 1) Prohibits students from performing the dissection of an animal in a California public or private school.
- 2) Defines “dissection” to mean the viewing of, or the act of, dismembering or otherwise destructive use of an invertebrate or vertebrate animal, in part or in whole, preserved or freshly killed, in the study of biological sciences. Animal dissection does not include fixed histological samples of any species, including plain or stained microscope slides, owl pellets, human autopsy viewing, and plastinated human organs.
- 3) Adds three-dimensional models, interactive simulation software, and assessments of knowledge to the definition of alternative education projects.
- 4) Extends to private school students the same rights at public school students to refrain from the harming or destroying of animals, and to be given an alternative education project.

EXISTING LAW:

- 1) Requires each teacher teaching a course that utilizes live or dead animals or animal parts to inform the students of their rights to object.
- 2) Requires a student with a moral objection to dissecting or otherwise harming or destroying animals, or any parts thereof, to notify his or her teacher regarding this objection, upon notification by the school of his or her rights.
- 3) States that if the student chooses to refrain from participation in an education project involving the harmful or destructive use of animals, and if the teacher believes that an adequate alternative education project is possible, the teacher may work with the student to develop and agree upon an alternate education project for the purpose of providing the student an alternate avenue for obtaining the knowledge, information, or experience required by the course of study.
- 4) Requires that the alternative education project require a comparable time and effort investment by the pupil, and prohibits it from being more arduous than the original education project as a means of penalizing a student.
- 5) Prohibits discrimination against a student based upon his or her decision to exercise his or her rights to object to refrain from dissection.

- 6) Requires students choosing an alternative educational project to pass all examinations of the respective course of study in order to receive credit for that course of study. If such tests require the harmful or destructive use of animals, permits a student to seek alternative tests.
- 7) Requires that a student's objection to participating in an educational project pursuant to this section shall be substantiated by a note from his or her parent or guardian.
- 8) Requires that a teacher's decision in determining if a pupil may pursue an alternative educational project or be excused from the project not be arbitrary or capricious.
- 9) States that nothing shall prevent any student from pursuing the grievance procedures in existing law.
- 10) Defines "animal" to mean any living organism of the kingdom animalia, beings that typically differ from plants in capacity for spontaneous movement and rapid motor response to stimulation by a usually greater mobility with some degree of voluntary locomotor ability and by greater irritability commonly mediated through a more or less centralized nervous system, beings that are characterized by a requirement for complex organic nutrients including proteins or their constituents that are usually digested in an internal cavity before assimilation into the body proper, and beings that are distinguished from typical plants by lack of chlorophyll, by an inability to perform photosynthesis, by cells that lack cellulose walls, and by the frequent presence of discrete complex sense organs.
- 11) Defines "alternative education project" to include the use of video recordings, models, films, books, and computers which would provide an alternate avenue for obtaining the knowledge, information, or experience required by the course of study in question. Defines "alternative education project" to include "alternative test."
- 12) Defines "pupil" to mean a person under 18 years of age who is matriculated in a course of instruction in an educational institution. For the purpose of asserting the student's rights and receiving any notice or response, defines "pupil" to include the parents of a matriculated minor.
- 13) Exempts classes and activities conducted as part of a program in agricultural education that provide instruction on the care, management, and evaluation of domestic animals from the above requirements.
- 14) Requires that each teacher endeavor to impress upon the minds of the pupils kindness toward domestic pets and the humane treatment of living creatures, among other topics.
- 15) Requires that, in school-sponsored activities and classes held elsewhere than on school premises, live vertebrate animals not, as part of a scientific experiment or any other purpose:
 - a) Be experimentally medicated or drugged in a manner to cause painful reactions or induce painful or lethal pathological conditions.
 - b) Be injured through any other treatments, including, but not limited to, anesthetization or electric shock.

- 16) Requires that live animals on the premises of a public elementary or high school be housed and cared for in a humane and safe manner.
- 17) States that the above provisions are not intended to prohibit or constrain vocational instruction in the normal practices of animal husbandry. (EC 51540)
- 18) Requires governing boards of school districts, when adopting instructional materials for use in schools, to require such materials, as they deem necessary and proper, to encourage the humane treatment of animals and people, among other topics.
- 19) Requires governing boards of school districts, when adopting instructional materials for use in the schools, to include only instructional materials that accurately portray humanity's place in ecological systems and the necessity for the protection of our environment.

FISCAL EFFECT: This bill has been keyed non-fiscal by the Office of Legislative Counsel.

COMMENTS:

Need for the bill. The author states, "Animal dissection has played an instrumental role in learning about anatomy in our classrooms. However, with the advancements in educational technology, educators now have the opportunity to use alternative methods for a more humane, cost-effective, and environmentally friendly way to protect our students and educators from exposure to carcinogenic chemicals, and protect our environment and ecosystem. AB 1586 would replace the use of 'live' animal dissections with an alternative advanced technology to still provide the same scientific instructional technology."

Issues related to animal dissection. The issue of animal dissection in schools raises numerous issues, among them are pedagogical, social, animal-focused, health and environmental, fiscal, equity, access issues, and issues of local control and the role of the state. Below is a discussion of these issues and the varying perspectives on them:

- **Pedagogical issues:** Some argue that, as professionals, teachers should have the freedom and responsibility to make instructional choices they believe are best for teaching and learning. They argue that dissection is aligned to and supportive of key concepts of inquiry, exploration, and use of phenomena in the Next Generation Science Standards (NGSS), and that there is inherent educational value in the use of real objects for teaching science which cannot be replicated by other means. They also argue that some students find the experience so engaging that it motivates future study of science.

Others argue that while dissection has played an important role in science education in the past, it is an outdated practice that has become a ritual of science education. They argue that with current technology dissection can be replaced with alternative methods of learning which are instructionally effective while not raising ethical, environmental, or health concerns. They argue that the NGSS do not require that students' life science curriculum include dissection. They also argue that some students experience such discomfort with dissection that it dissuades them from future study of science.

- **Social issues and pupil rights:** Some argue that animal dissection promotes a decreased sensitivity to, and a trivialization of, animal life, and that it can result in ethical or moral

discomfort for students. They cite instances of students who are opposed to dissection being pressured into the activity, not being provided suitable alternatives, or incurring academic penalties. Others argue that when conducted properly, dissection can teach a respect for life and the interrelationship and interdependency of all things. They support the right of students to opt out of dissection instruction and be provided a high quality alternate activity.

- **Animal-focused issues:** Some object to dissection on moral grounds because it is connected to the pain, suffering, and death of animals. They cite the practices of breeding, trapping, confinement, and killing as inhumane, and raise concerns about the use of some threatened species, the sourcing of some animals from their natural habitats or from animal shelters, and the breeding of some animals at facilities that cater to businesses that use animals in educational experiments and in laboratories. Others argue that some of the animal parts used for dissection are by-products of the food industry that would otherwise be discarded, that others can be sourced humanely, and agree that animals should not be sourced in a manner that poses environmental threats.
- **Health and environmental issues:** Some argue that the process of supplying animals for dissection has a significant environmental impact, that removing animals from ecosystems can inflict lasting damage, that when animals are preserved in formaldehyde students and teachers are exposed to a hazardous chemical, and that improper disposal can cause health and environmental problems. Others, who support the option to teach dissection, agree that students' dissection experience should not come at a cost to ecosystems, and argue that less- or non-toxic alternatives can be used to preserve specimens.
- **Issues of local control and the role of the state.** Some argue that the choice to instruct students using dissection should be a local choice made by educators and not determined by the state. They also note that the existing process also allows for deliberation and public input by content experts and leading practitioners, in the context of the scope and sequence of each subject. Others note that state law already speaks to some teachers' activities in the classroom, requiring that teachers teach "kindness toward pets and the humane treatment of living creatures."
- **Fiscal, equity, and access issues.** Some raise concerns about the cost of providing alternatives to dissection, noting that there would be initial costs involved with changing methods. They also raise concerns that poor access to hardware and connectivity in some schools could create access and equity problems, and that the cost of alternatives includes the hardware necessary to run software programs. Others argue that while there are up-front costs associated with procuring alternatives, such as software licenses, the cost of alternatives is lower over time than the annual cost of procuring animals and other supplies, and that some low cost and free materials are available.

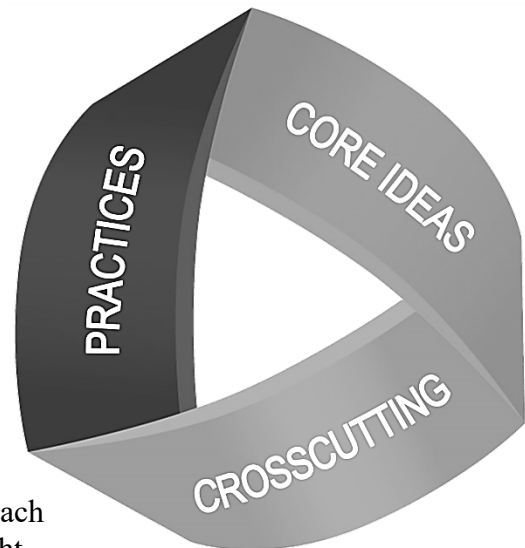
Key questions for this Committee to consider. The list above demonstrates the broad range of issues that arise in a discussion about animal dissection in education. Each of these issues merits discussion and critical evaluation. However, as this Committee's jurisdiction is education, ***the Committee may wish to consider the following as the primary questions raised by this bill:***

- Is dissection an effective means of teaching the state's current science content standards?

- Are alternatives to dissection effective means of teaching students the state’s current science content standards?
- If both methods are effective, should the state prohibit teachers from using one method of teaching students the state’s current science content standards, or should teachers have the choice of using either or both methods?

Is dissection an effective means of teaching the state’s science standards? In 2013, the State Board of Education (SBE) adopted the NGSS as the state’s science content standards.

In contrast to California’s previous science standards, NGSS shifts the focus of instruction from having students memorize scientific information to teaching students how to think critically about core scientific ideas (disciplinary core ideas), how to connect key concepts across disciplines (cross cutting concepts), and how to implement processes used by practicing scientists (science and engineering practices), such as asking questions, developing and using models, and planning and carrying out investigations. This “three dimensional” approach to science education is represented by the graphic to the right.



Starting this year, students are being tested using the California Science Test (CAST), an NGSS-aligned assessment which similarly shifts the focus from assessing recall of facts to measuring the ability of students to apply their knowledge and skills through the NGSS science and engineering practices, disciplinary core ideas, and crosscutting concepts. In other words, the new assessment will test students’ scientific knowledge as well as their ability to “do science.”

The NGSS standards and the state’s science curriculum framework do not specifically direct teachers on how to teach science content, and they do not mention animal dissection. However, activities such as dissection align well with some of the key instructional features of the state’s new standards:

- Learning is intended to be hands-on, collaborative, and in an integrated environment rooted in inquiry and discovery.
- Instruction is grounded in student-centered learning that enables students to think on their own, problem solve, communicate, and collaborate—in addition to learning important scientific concepts.
- The goal of instruction is for students to be able to engage with and explain real-world phenomena and to design solutions using their understanding of the disciplinary core ideas.

For example, under NGSS the traditional goal of using dissection to teach anatomy shifts to a goal of teaching concepts, connections, and practices of science. Dissection is one way that students can learn about the *cross-cutting concept* Structure and Function (the way an object is shaped or structured determines many of its properties and functions) in the study of life science. Dissection of phenomena such a chicken foot, a cow’s eye, or a sheep heart could allow students

to investigate structure and function in a hands-on way that promotes inquiry and discovery. Through dissection students can plan and carry out investigations (*a science practice*), make observations about the relationship between structure and function (*a cross-cutting concept*), and discuss variations of traits they observe (*a disciplinary core idea*).

Are alternatives to dissection an effective means of teaching the state's science standards?

There are numerous products which can be used as alternatives to, or in conjunction with, dissection instruction. These include interactive software programs, tablet applications, videos, life-like models and other realia, and virtual reality applications. Some alternatives cited by the author and People for the Ethical Treatment of Animals (PETA) include the following computer or model based programs:

- Froguts: Digital dissection modules for frog, squid, sea star, cow eye, and fetal pig labs. This program is offered for free
- Expandable Mind Software: Digital dissection modules for ten animals, including frogs, fish, pigs, and cats
- Froggipedia: Application for mobile phone or tablet for frog dissection
- Biosphera: Desktop and mobile software modules using touch-screens with the anatomies of cats, frogs, cows, fish, and other species

The author also notes that there are loan programs and databases which provide alternative materials, including:

- Animalearn's Science Bank
- National Anti-Vivisection Society's BioLEAP Lending Program
- Ethical Science Education Coalition's Alternatives Loan Library
- The International Network for Humane Education (InterNICHE)
- Norwegian Inventory of Audiovisuals (NORINA)

Numerous studies have investigated the effects of dissection versus alternative methods, but it is difficult to apply much of it to the question raised by this bill. Much of the literature involves postsecondary students (who are voluntarily engaged in life science study), and not all of the literature is peer-reviewed. Most importantly, the literature does not reflect the current science standards (which, as noted above, shift the focus of instruction), newer technology, or the measures of performance used on the current science assessment.

One pre-NGSS analysis comparing the use of animals (both dissection and vivisection) and alternative methods, *Systematic review of comparative studies examining alternatives to the harmful use of animals in biomedical education* (2007), examined controlled studies conducted in both K-12 and postsecondary institutions. The authors reviewed 17 randomized controlled trials or nonrandomized trials that included a comparison group, of which 3 involved high school biology students (Fowler, 1968; Kinzie, 1993; Strauss, 1994). The authors found that in all studies reviewed, "results associated with the alternative method of instruction were not significantly different from or superior to results associated with the conventional method." The authors note that "these findings appeared to be robust, as they involved a wide range of participants, alternatives, and outcomes," and conclude that "alternatives are a viable method of instruction in the field of biomedical education."

However, it is important to note that this research was conducted based on prior science standards, which reflected a more traditional teaching of science. It is unclear whether the alternatives offer comparable opportunities for students to engage in scientific practices or whether they function best as programs to teach scientific facts such as anatomy. As noted above, the state's new science assessment will measure the ability of students to apply their knowledge and skills through the NGSS science and engineering practices, disciplinary core ideas, and crosscutting concepts. *The Committee may wish to consider* that students' performance on the state's new standards when using alternatives to dissection has not yet been investigated.

How are instructional decisions usually made? This bill would prohibit by law the use of one form of instruction – animal dissection - in the teaching of science. This represents a departure from the manner in which instructional decisions are traditionally made. With few exceptions, curriculum is established through an administrative process at the state level, while instructional decisions are entrusted to local school districts and teachers.

The curriculum of the California public schools is adopted by the SBE. Content standards in each subject, which define the knowledge, concepts, and skills that students should acquire at each grade level, are developed by the Instructional Quality Commission (IQC), based on the input of experts in content and instruction and of the public, and then are adopted by the SBE. The SBE then adopts curriculum frameworks, which provide guidance for implementing the content standards. The SBE then adopts instructional materials for grades K-8 based on the curriculum frameworks, and school districts pilot and select instructional materials to purchase for their teachers. In the case of the state's current science curriculum, the process began with the enactment of legislation in 2011, and spanned the next seven years until the adoption of the curriculum framework in 2016 and instructional materials in 2018. *The Committee may wish to consider* whether mandating or prohibiting specific instructional methods in statute is an appropriate role for the state.

How common is dissection, and which animals are dissected? Research indicates that, nationally, between 75% and 84% of biology teachers use dissection (Oakely, 2012; Osenkowski, 2015). No research specific on California teachers' practices appears to be available.

Data provided by the author on school district purchasing information obtained through California Public Records Act requests show that, among a number of California's large school districts for the current and prior academic years, the most commonly purchased items included frogs, fetal pigs, cows' eyes, sheep hearts and brains, worms, squid, and rats. Other animals purchased in smaller numbers include cats, mink, planaria, crayfish, shark, and sea urchin. The Los Angeles Unified School District purchased 5,035 animals or animal organs, at a cost of \$16,321. A recent national survey of biology teachers (Osenkowski, 2015) indicates that the most commonly dissected animals are frogs, fetal pigs, earthworms, crayfish, and bony fish.

Where do animals and animal parts used in dissection come from? As noted below, the National Science Teachers' Association (NSTA) recommends that animals used in dissection be purchased from a reputable and reliable scientific supply company, and states that an acceptable alternative source for fresh specimens (i.e., squid, chicken wings) would be an FDA-inspected facility such as a butcher shop, fish market, or supermarket.

Purchasing information provided by the author for several large California school districts indicates that animals and animal organs are purchased from at least 12 different suppliers. Biological supply companies indicate that animal parts such as cow's eyes, sheep hearts and brains, and fetal pigs are by-products of the food industry. Other animals are purchased through suppliers who raise or catch them for food or other purposes (earthworms from bait suppliers, rats from reptile food suppliers, sharks from the fishing trade). Cats come from shelters where they have been euthanized. One company indicates that frogs are purchased from a supplier of frogs' legs, and that the frogs are caught in an agricultural habitat.

PETA raises concerns that the animals supplied for dissection do not die of natural causes, and that the majority are not killed painlessly. They cite a recent investigation of a Minnesota biological supply company which was charged for animal cruelty in their processing of animals for dissection. They also raise concerns about the taking of animals from natural habitats, citing one company's statement that grasshoppers and earthworms are sourced by professional collectors, and a 1999 Department of Interior statement that the trade in amphibians for, among other purposes, dissection, poses a threat to amphibians.

Cost of alternatives compared to animal dissection. Below is a comparison of both one-time and ongoing costs of animal dissection and one software-based alternative. The following comparison is based on a class of 30 students, with either one student per computer or two students working together on the dissection of a frog. Costs are from current websites for the Digital Frog 2.5 software and the Carolina Biological Supply Company.

The one-time cost of Digital Frog 2.5 software for 30 students is \$625.00 for a lifetime license, or \$253.00 for an annual subscription. In addition, there are unknown technology costs, for computers and wireless access, some of which has already been incurred. Apart from replacement and upgrading of computers, there are no ongoing costs for use of the Digital Frog 2.5 software if a lifetime license is purchased, and for a subscription the annual cost is \$253.00.

Schools often purchase dissection kits which include both the animal specimen and dissection equipment. A class set of 15 frog dissection kits from Carolina Biological Supply would cost \$192.75 (\$12.85 each) per year. These kits include all supplies necessary for dissection, except for gloves (\$17.95 for 100), goggles (\$56.00 for 15, which could be reused), paper towels, aprons (\$33.80 for 100) and cleaning supplies.

Student attitudes toward, and experience with, dissection. Research on student attitudes toward, and experiences with dissection, including objecting to dissection, is presented below.

- In a national study of 500 students, (Osenkowski, 2015), 48% of students indicated that they are interested in animal dissection and would not prefer using an alternative. 37% of students would prefer using an alternative. 45% of students indicated that they had greater interest in science because of animal dissection. 34% of students indicated that they would like biology education to be more computer-based, and 40% indicated that they would not. 68% of students agreed that students should have a choice to opt-out of dissection. 38% did not know whether dissection alternatives were available to them.
- One study of 10th and 11th grade Canadian students (Oakley, 2013) found that 54% of students participated in animal dissection willingly and 35% participated with mixed feelings. 8% reported not wanting to participate and informing the teacher, but being

convinced to participate, 10% reported doing an alternative activity, 4% skipped class, and 2% reported not wanting to participate and being given a failing grade on the assignment. Of the students who objected to the dissection activity, 80% reported personal objections, 72% reported animal rights objections, 61% reported ethical or moral objections, and 34% reported environmental, and 4% reported religious objections (total exceeds 100% because students could mark multiple answers).

Teacher attitudes toward, and experiences with, dissection. Research on teacher attitudes toward, and experiences with dissection, including objecting to dissection, is presented below.

- In a national study of 1,178 teachers' attitudes toward dissection (Osenkowski, 2015), 70% of teachers reported that dissection is the best way to teach anatomy and physiology, 60% disagreed with the statement, "dissection is no longer necessary to teach the life sciences," and 62% disagreed with the statement, "I have ethical concerns about dissection." 54% believed that alternatives are as good as dissection for teaching anatomy and physiology. 70% of teachers reported using alternatives to dissection, with 36% using them in place of dissection and 34% using them in conjunction with dissection. 67% of teachers indicated that they would continue to teach animal dissection because students want to dissect, and 69% said that student performance is the most important factor in choosing animal dissection or alternatives. Only 53% of teachers in states with opt-out laws responded that their schools had such policies, and 29% responded that their school did not have such a policy, and 18% did not know.
- In a study of Canadian science and biology teachers (Oakley 2011), 74% identified pedagogical benefits of dissection, including solidifying students' knowledge of structure, function, placement, and interconnectedness of organs and systems, as well as the most authentic way to learn about anatomy and physiology. 62% identified "realism" as a benefit, including demonstration of similarities and differences between organisms (including of the same species). 58% identified the benefit of experiential, hands-on learning, and 58% identified student engagement and interest. 46% identified concerns regarding student safety in the lab, including exposure to formalin, and 30% identified pedagogical concerns around classroom management, students' learning and retention, and addressing and evaluating students who refuse to dissect.

Research points to lack of awareness of opt-out policies. Several studies point to poor awareness of dissection opt-out policies:

- In the national study of 1,178 teachers described above (Osenkowski, 2015), only 53% of teachers in states with opt-out laws responded that their schools had such policies, and 29% responded that their school did not have such a policy, and 18% did not know. This study found that 90% of teachers indicated that less than 5% of students request alternatives, while 14% of students responded that they had refused to dissect or requested an alternative.
- Research suggests that a small number of students will object to dissection, but that "many students may not want to participate in a dissection but may be unwilling to voice their opposition to it due to fear of a failing grade, fear of embarrassment in front of their peers, or fear of challenging the authority of their teacher." (Balcombe, 2000; Hart, 2008).

Educator policy statements regarding animal dissection. The National Association of Biology Teachers' (NABT) policy on animal dissection states that the study of organisms is essential to the understanding of life on Earth, and recommends “the prudent and responsible use of animals in the life science classroom” and that biology teachers “foster a respect for life and should teach about the interrelationship and interdependency of all things.”

NABT also argues that teachers have a responsibility to ensure that the use of nonhuman animals in instruction have sound educational objectives, convey substantive knowledge of biology, and be appropriate for the classroom and for the age of the students. NABT argues that biology teachers are in the best position to make this determination for their students. NABT encourages teachers to be approachable and responsive to substantive student objections to dissection and to provide appropriate lessons for those students, but also urges teachers to be aware that alternatives to dissection have their limitations. NABT supports the use of these materials as adjuncts to the educational process but not as exclusive replacements for the use of actual organisms.

National Association of Science Teachers (NSTA) policy statement is similar to that of the NABT. Regarding the use of dissection activities in school classrooms, NSTA has issued recommendations for science teachers that include:

- Be prepared to present an alternative to dissection to students whose views or beliefs make this activity uncomfortable and difficult for them.
- Conduct laboratory and dissection activities with consideration and appreciation for the organism.
- Plan laboratory and dissection activities that are appropriate to the maturity level of the students.
- Use prepared specimens purchased from a reputable and reliable scientific supply company. An acceptable alternative source for fresh specimens (i.e., squid, chicken wings) would be an FDA-inspected facility such as a butcher shop, fish market, or supermarket. The use of salvaged specimens does not reflect safe practice.
- Address such issues as allergies and squeamishness about dealing with animal specimens.
- Ensure that the specimens are handled and disposed of properly.
- Base laboratory and dissection activities on carefully planned curriculum objectives.

Animal dissection in school curricula. According to Why Dissection? (Hart, 2008), nonhuman animals have historically been used as surrogates for the purpose of learning human anatomy. In the 19th century, the discoveries of Charles Darwin and the emergence of educational theory which emphasized both discovery and instruction in practical subjects led to increasing emphasis on science in school curricula. It was at this time that biology became part of the school curriculum. In the 1920's, during the progressive education era, frog dissection became common in university courses and subsequently in pre-college instruction, and by the 1960's it was a widespread instructional practice (Orlans, 1993).

Beginning in the 1980s some high school students began to refuse to dissect animals, and in 1987 a Victor Valley, California tenth grade student named Jennifer Graham refused to dissect a frog while enrolled in a course required for graduation, citing her moral beliefs and her mother's religious beliefs. The school refused to let her abstain from the activity, and she sued. The court dismissed the case in 1988 with the provision that the school provide the student with a frog that had died of natural causes, but no such frog was forthcoming. The case was eventually settled.

In 1988, Governor Deukmejian signed AB 2507 (Speier), Chapter 65, Statutes of 1988, which established a right of students to opt-out of animal dissection. Since then at least 18 other states and Washington, D.C. have enacted similar policies. No state has enacted a prohibition on animal dissection.

Arguments in support. Social Compassion in Legislation writes, “Animal dissection is a fixture in California’s secondary education system. For instance, LAUSD – California’s largest school district – had their students dissect 500 earthworms, 785 sheep brains, and 700 sheep hearts between 2017 and 2018. In 2018 alone, LAUSD teachers had their students dissect 1,100 frogs. Clearly, many students’ biology curriculum includes treating animal bodies without compassion.

Schools incur high costs to teach their students with dissection; for a high school with 5 sections of biology and 30 students in each class, the cost of dissecting frogs is approximately \$981 each year. However, schools are not required to incur these costs; the 2013 Next Generation Science Standards (NGSS) do not require that students’ biology curriculum include dissection. Indeed, the NGSS fails to even mention dissection.

There currently exists several educational programs – 3D models, digital dissection programs, virtual reality programs, and even applications – that have emerged as sound alternatives to dissection. These programs have proven to engage and educate students. They are even far less expensive than dissection; for example, digital program Digital Frog costs schools \$224 as a one-time fee, and dissection applications may cost as little as \$2.99 per user.

Formaldehyde is used as a preservative for animals used for dissection. The chemical is found in cigarette smoke—it is classified as a human carcinogen, and repeated exposure to low levels can cause respiratory difficulty, eczema, and skin sensitization. There is no reason for any student to cut apart an animal or be exposed to carcinogenic formaldehyde when there is state-of-the-art 3-D software available for free.”

Arguments in opposition. The California Teachers Association (CTA) writes, “AB 1586 undermines the local decisions and authority of educators and school districts to use dissection in classroom instruction, consistent with state-adopted science standards and frameworks. The bill jeopardizes equal educational access for students to a well-rounded and standards-based curriculum preparing them for successful careers in many scientific fields, including pharmacy, medicine, agriculture, veterinary medicine, genetics, marine biology, and engineering.

CTA’s organizational policy on academic freedom states: ‘Curricula that limits the ability of educators to incorporate teachers’ own styles, attributes, and standards-aligned instructional materials infringe upon academic freedom.’ The professional judgement of classroom teachers to determine appropriate and aligned curricula is key to student achievement and growth. Teachers have a central role in the development, definition, and implementation of curricula...Curricular decisions should be based on current, valid research, including, but not limited to, multiple intelligences, adequate learning time, recognizing student differences, and providing an enriched environment and recognizing that a single method or set of materials may not be appropriate for all learners.

CTA supports allowing students in grades K-12 with a moral objection to refrain from participating in [dissection]. This bill is not necessary given the state’s ‘opt out’ law for

students. Educators respect their students' beliefs and right to make an informed decision about their participation in science projects involving dissection.

Banning all animal dissections prevents students the opportunity to receive a high-quality science education, including learning through animal dissection labs. Limiting high-quality science education consistent with the Next Generation Science Standards in grades K-12 is not the answer to promoting the importance of science to California's economy and respecting educator and district local authority to select standards-aligned instructional materials to implement the science education curricula for all students."

Other concerns with the language of this bill. In addition to the issues raised by the opposition to this measure above, ***the Committee may wish to consider that:***

- This bill prohibits the "viewing" of animal dissections, which would have the effect of prohibiting teachers from performing a dissection for students to observe, could prohibit the viewing of videos of dissection, and might even prohibit the use of some alternative curricula which include video clips of actual dissections.
- This bill's requirements extend to private schools, in effect setting instructional policy on schools outside of the public school system. This represents a departure from traditional practice and may set a significant precedent.

What are alternate proposals which would maintain discretion of teachers while addressing some of the concerns raised above? Alternatives to the prohibition proposed by this bill, which would address some of the proponents' concerns could include any of the following:

- **Strengthening of students' rights to opt-out and be given an alternate assignment.** Current law states that an alternative assignment "may" be provided. This could be strengthened to require that such an assignment is given. The provision for 'grievance procedures' could also be strengthened by referencing the Uniform Complaint Procedures complaint process. Knowledge of students' opt-out rights could be improved by requiring that written notice be provided to parents of their students' rights.
- **Protections against inappropriate sourcing of animals for dissection.** Current law is silent on the sourcing of animals for dissection. This could be changed to prohibit the sourcing of animals that are threatened or endangered, or to prohibit the use of animals taken from natural habitats.
- **A pilot program with a randomized controlled study** evaluating the difference in achievement on specified life science standards based on the results of the new NGSS-aligned CAST assessment, between dissection and alternatives.
- **Guidelines for appropriate use of dissection in schools.** To address concerns about the inappropriate use of animals in dissection, the state could require the California Department of Education to establish minimum standards for the use of animals in dissection, addressing some of the social and environmental issues raised above.

REGISTERED SUPPORT / OPPOSITION:

Support

Physicians Committee for Responsible Medicine (co-sponsor)
Social Compassion in Legislation (co-sponsor)
Animals In Science Policy Institute
Expandable Mind Software
Humane Education Advocates Reaching Teachers
Institute for Humane Education
National Hispanic Medical Association
People for the Ethical Treatment of Animals
3,970 individuals

Opposition

Association of California Egg Farmers
California Agricultural Teachers Association
California Farm Bureau Federation
California Federation of Teachers
California Grain and Feed Association
California Pork Producers Association
California Science Teachers Association
California Teachers Association
California Wool Growers Association
National Association of Biology Teachers
Pacific Egg and Poultry Association
Several individuals

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