



specimens allow only superficial observation of gross anatomy. Alternatives more accurately present the complexity of organisms, body systems (e.g., circulatory, respiratory), and interrelationships. They provide histological images, animations, and video clips of body processes, and allow students to re-examine their lessons – unlike dissections that can destroy specimens.

Promoting Access to Science

Dissection can discourage some students from pursuing science careers.

Veterinary students can choose to learn through the “ethically sourced” use of clients’ animals

Studies indicate some students experience long-lasting negative feelings about dissection, dissuading them from a science career. Today animal use is unnecessary even in medical schools, research, and other areas of science. For example, growing numbers of toxicology labs rely only on *in vitro* methods.

Promoting Values

The development of positive, thoughtful ethics is an essential goal of all education.

Alternatives foster environmental stewardship and compassion for life. Specimen dissection treats animal life as expendable and the environment as irrelevant – it is a teaching tool responsible for removing animals from their habitat, breeding them for profit, killing them, infusing them with chemicals, and then discarding them.

Promoting Environmental Ethics

Dissection contributes to the decline of wildlife populations, exposes students to toxic chemicals, and contaminates the environment.

Millions of animals are taken from the wild for dissection – including amphibians, birds, reptiles, fish, and invertebrates – despite declining populations due to habitat loss, pollution, and climate change. Frogs, for example, cannot be successfully bred in captivity and must be taken from their habitats. As a result, dissection contributes to ecological imbalance.

Preservation of animals as specimens involves toxic chemicals such as formaldehyde and its derivatives, designated by the EPA as likely carcinogenic, a hazardous air and water pollutant, and a waste constituent. Disposal of specimens is risky to students, teachers, ecosystems, and public health.

Promoting Animal Welfare

Alternatives facilitate learning without the suffering and death of animals.

If not purposely bred, animals destined to be specimens come from the wild, slaughterhouses, shelters, pound seizure, and random source dealers who obtain animals in a variety of ways including “free to a good home” ads and taking lost or abandoned “pets.”

No matter the source, animals endure inhumane treatment prior to death. Abuse has been documented at supply companies as well as with dealers. While some believe using animals that are a byproduct of an-

other industry is more ethical, the abuse and suffering within that industry must be considered. Fetal pigs and cow and sheep organs come from slaughterhouses and factory farms, where rampant abuse has been well documented.

Animals are often shipped live, crammed in small cages with no temperature regulation, food, or water. Depending on where in the chain of supply they are killed, methods include suffocation, drowning, electrocution, gassing, or lethal injection.

Promoting a Better Tomorrow

Cost-effective alternative dissection options are widely available and provide comparable or better learning.

As science and technology advances, so too must the educational approaches of our schools and universities. Alternatives to specimen dissection are one such advance. Educators who embrace alternatives are realizing the benefits they present for not only their classrooms, but for the world at large. Students come away with deeper understandings of their science lessons, respect for animals as sentient beings with whom we share our world, and appreciation for how individual choices can be part of our environmental crisis or part of its solution.

“NSTA encourages teachers to be sensitive to students’ views regarding dissection and...their right to make an informed decision about their participation.”

-The National Science Teachers Association

Promoting Student Learning

Studies comparing specimen dissection with alternatives found students learn as well or better using alternatives.

Alternatives demonstrate scientific principles, teach problem solving, and expose students to scientific technology. They fulfill traditional anatomy lessons and offer learning activities such as:

- structure, function, and levels of living systems
- cells, whole organisms, and ecosystems
- composition and interaction of systems
- organism internal regulation and relationship with the external environment

Arguing for dissection because it is “hands on” is simplistic. Animal bodies are drastically changed during death, embalming, shipping, and storage. Organ color is distorted and

More than 90% of U.S. medical schools no longer use animals in their curricula

Alternatives allow students to:

- Learn interactively
- Repeat and review lessons
- Study realistic anatomy, physiology, and behavior of a variety of species including humans
- Simulate step-by-step dissection
- Explore functioning systems at the organ, tissue, cellular, and molecular levels

Alternatives also benefit school budgets! Unlike specimens, alternatives are not one-time use only and do not require tools such as scalpels or pans. Cost comparisons show in the long run they are less expensive.

“It’s important that education is not only forward thinking, but also takes full advantage of the advances immediately available. Sophisticated and engaging alternatives to specimen dissection are readily available, enhancing traditional curriculum goals with a vast array of new possibilities for both teacher and student.”

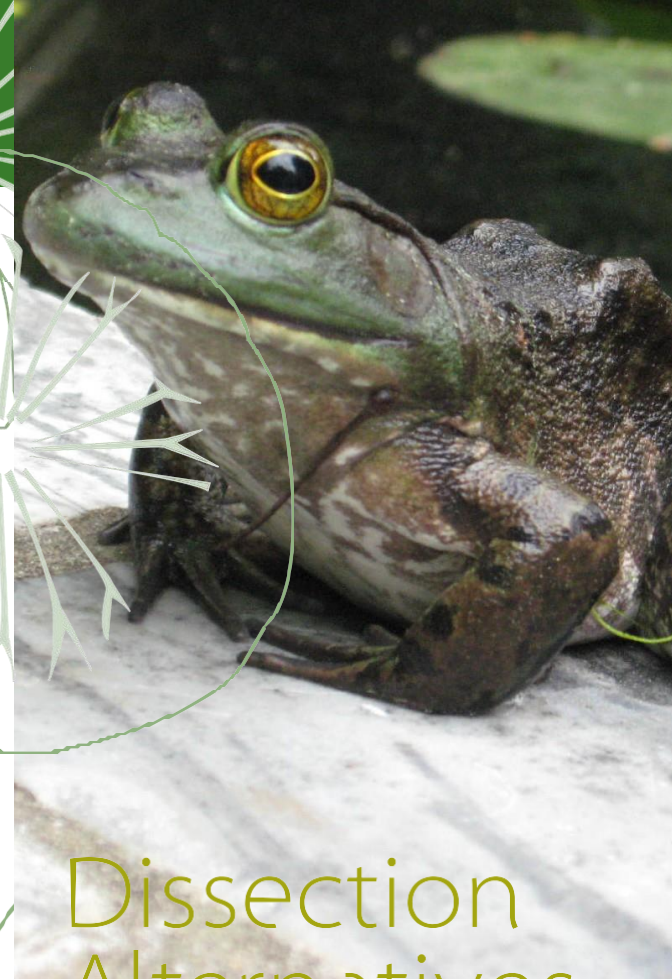
**-Theodora Capaldo, EdD
NEAVS President Emeritus**

To learn more, please visit:

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Dissection Alternatives

**Affordable, effective, creative
learning tools for biology,
anatomy, and physiology**



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Dissection alternatives have greatly expanded over the last decade, benefiting students, budgets, the environment, and animals. Alternatives demonstrate anatomy and physiology, as well as the complexity and interconnectedness of life, fulfilling and enhancing science education. Educational reasons to replace traditional specimen dissection are numerous, and alternatives are now common at all levels of education and professional training.

Software and models allow teachers to:

- Control pace, focus, and direction of lessons
- Explore comparative anatomy and physiology
- Teach human and animal relationships with the environment
- Encourage independent as well as group learning
- Evaluate progress through online lessons and quizzes