



Pithing

This method also refers to a procedure used in biology classes to immobilize a specimen, by inserting a needle up through the base of the skull (from the back) and then wiggling the needle around, destroying the brain. It allows for dissecting the frog, as well as observing its living physiology, such as the beating heart and expansion and contraction of the lungs, without causing unnecessary pain to the animal. The specimen remains living because respiration continues through the skin without cerebral control.**

<http://paragon310.multiply.com/photos/photo/13/19>

**<http://en.wikipedia.org/wiki/Pithing>

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Dissection Has Been An Unquestioned Part Of Biology Class Since the 1920'S Until 1987

Dissection has been a part of biology class since the 1920's, but in 1987, a brave 15-year-old Californian named Jennifer Graham refused to dissect an animal and sued her school district. She argued for a comparable academic option. A year later, California would grant that right to all high school students (nine other states have followed). 2009 is far different from 1929. Today, we have sophisticated models and computer programs (capable of detailed virtual dissections). My son opted-out in 9th grade and still gained a broad understanding of the anatomy by using the school-provided program.

Millions of animals are *harvested*, sold, and dissected annually in America. Therein lies the irony. Biology, the science of life, is studied through destruction of said life. How paradoxical is teaching about a frog's ability to live through an act (dissection) that kills him? Teachers can *teach life* by visiting animals in their natural habitats (preserves, sanctuaries), and death can be covered without killing (medical school cadavers).

Classroom dissection is big business, and Carolina Biological is the industry leader. Their website (complete with shopping cart) offers a wide variety of products (including skinned cats). To be fair, they also sell virtual kits, but their primary business is selling dead animals. Remember, all animals used in dissections must be replaced each term, while models and computer programs last years. Carolina is also deliberately inexact about their sources: "...some from cultures, some from natural or managed habitats where seasonal collections are made, and many from the food industry." The fetal pigs are extracted from their mothers at the slaughterhouse (as well as single organs like the cow's eye my daughter examined in sixth grade). Some cats come from shelters when deemed unadoptable.

The Physicians Committee for Responsible Medicine writes:

An investigation of Carolina Biological Supply Company (CBSC), the largest animal supply business in the United States, found cats arriving in crowded cages, being poked with metal hooks, and finally being sent into gas chambers (some giving birth or making sounds after the gassing, indicating they were not yet dead). In 1991, the U.S. Department of Agriculture charged the CBSC with 10 violations of the Animal Welfare Act, including one charge of embalming cats who were still alive. When they are "prepared" for dissection, frogs are usually dropped in a water-and-alcohol solution, which can take up to 20 minutes to cause death.

Today, there is less stigma attached to opting-out, but the complete elimination of middle and high school dissection faces two giant obstacles: commerce and convention. Companies like Carolina have a vested interest in the continued practice, and science teachers are teaching as they were taught. Fortunately, not all scientists adhere to this convention. Biologist Jonathan Balcombe: *"Studies show that nonanimal methods teach concepts in biology and anatomy just as well or better than animal dissection."* And pathologist Nancy Harrison: *"As a doctor who performs autopsies, I can assure students that computer images of well-preserved tissues look more like the "real thing" than the squishy gray organs of a formalin-fixed specimen."*

Pithing Procedure

Before the experiment, you need to render the frog insensitive to pain. Pithing is one procedure to accomplish this. Pithing will destroy the brain. (For some experiments, double pithing will include severing/destroying the spinal cord.) Pithing is relatively painless to the frog.

Read the entire procedure before beginning so you can perform the procedure quickly.

1. Hold the frog facing away from your body, with the lower extremities extended.
2. Grasp the frog with your first two fingers: first finger on the nose, second finger under the jaw. Flex the head forward (away from your body).
3. Move probe down midline, over a bump (as a reference point) that is the occipital process until you come to the soft spot of the foramen magnum.

Do not use undo pressure on the frog skin.

The frog skull is fairly hard cartilage; soft spot is at the end of the skull.

4. Insert the probe quickly into the cranial vault and sever the brain and spinal cord.
5. Move the probe into the cranial vault and move it from side to side to destroy the brain.

Without the brain, perception of any sensory phenomena is impossible.

6. Test for reflexes to confirm that sensory perception has been destroyed and ensure that the spinal cord is still intact, although it is now in shock.

| Corneal Reflex (sensory perception check) | Reflex Withdrawal Response (spinal cord check) |
|--|---|
| In a normal frog, as soon as you touch its eyelid, it will blink. With no brain, there is no response. | Pinch the frog's leg and it should withdraw as shown below. |

NOTICE: The frog may crouch, jump, or even make noise, but it is not in pain. These actions are neural reflexes controlled via motor senses in the spinal cord, not brain functions.

7. Keep the frog moist. The frog will still be breathing because frogs breathe primarily through the skin, not the lungs, so it is important to keep the frog moist.

8. Sever the spinal cord: Keep the probe in the cranial canal and turn the probe around into the vertebral canal (do this without removing the probe).

When the spinal cord is severed, the frog legs become completely limp (due to flacid paralysis of skeletal muscle). The frog will never assume a crouching position again, and if you pinch the frog after the spinal cord is severed, the frog will not feel anything and there will not be a reflex withdrawal. In other words, spinal severing makes work easier because the muscle no longer reflexes. Local muscle twitching resulting from spinal nerve ending stimulation may still occur.