



**Grade Level 9-12**

**Lesson Length**  
**1-2 class periods**

**Lesson Summary:** This lesson is an introductory activity to be used in conjunction with a lesson on dissection. Students gain insight into the social context and complexity of science through participation in an ethics of dissection debate.

## Standards Alignment

### Next Generation Science Standards

- 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- **Framework for K-12 Science Education:** Science & Engineering Practices 6,7,8

**Purpose:** The goal of this activity is for students to gain an in-depth understanding of the social context of science, the impact of ethical issues on scientific research, and the structure of a well-supported scientific argument.

### Objectives—Students will

- Discuss benefits and concerns of animal dissection. Suggested examples include: Is dissection an ethical activity? Is dissection an effective educational practice or are alternatives available that are as effective?
- Analyze an argument from opposing perspective.
- Communicate a position on the issue of animal dissection using logical argument with a claim that states a position on dissection and supports the position with facts and logical form.

### Assessment Options

- Communicate and defend position regarding animal dissection responding to writing prompt.
- Communicate and defend position on animal dissection during a graded discussion.

### Materials

- Variety of articles related to animal dissection (see **Resources** on page 4)
- Student Guide for each student: Pre-Research Activity Sheet
- Ethics of Dissection Writing Prompt with Focus Correction Areas (see **Evaluate** on page 3)

## **Lesson Overview**

Students will participate in a series of activities following the 5 E's framework (**Engage, Explore, Explain, Elaborate, and Evaluate**) to develop an understanding of issues related to animal dissection, its implications for scientific investigation, and contributions animals have made to the advancement of scientific knowledge. This lesson can be done in one day if research activities are assigned as homework.

## **Note to Teachers**

By the end of these activities, you should have a sense of any students who have a strong ethical or religious objection to animal dissection. These students need not participate in dissection to be integrated into the unit. They can be assigned the role of classroom Teaching Assistants whose job is to assist the learning by doing background research for and researching questions from the other students. It works very well if you have two or three computers in the lab so that, while they are busy dissecting, students can direct questions to the teaching assistants - getting feedback and interacting as a group.

## **Engage**

Introduce the topic of animal dissection by explaining the context, benefits, and concerns. Explain that many educators think there is simply no alternative as effective as dissection.

In an article entitled *Students Learn How, Not What, to Think About Difficult Issues* (Science 10 October 2008: 186-187), author Greg Miller argues it is essential that we teach students how to evaluate and develop ideas for themselves. Dissection affords students the opportunity to practice these skills directly - to experience the learning. In contrast, a virtual dissection is filtered learning -- the student is presented someone else's thoughts and judgments. A number of people disagree with this reasoning, suggesting the use of clay models and arguing that computer-modeling technology has advanced enough to offer effective alternatives to animal dissection.

Tell the students: "Your task is to:

1. Take a position for, against, or undecided about allowing animal dissection in science classes.
2. State at least three of your reasons and explain your reasoning.
3. Do the pre-research activity and then read the article (see **Resources** on pg 4) that takes the opposing view from your own. (You are welcome to read both.)
4. Interview six people on this issue. At least four must be adults.
5. After you read the article and interview others to research the issue, re-visit your position. Write a paragraph where you state your position, support your position, and describe how your position changed as a result of your research.
6. Come to class prepared to share and defend your position during a graded discussion."

Ask students to work individually and to take a written position on the issue of dissection, providing three reasons in support of their stance. After a brief show of hands to provide a visual for overall attitudes, divide students into study groups, putting together students who take the same position.

## **Pre-Reading Activity**

Direct students to work together in groups to do the Pre-reading Activity that will introduce them to vocabulary related to a valid academic argument and ethics. When they've finished, hand out the Activity Answer sheet and ask them record the "official" correct answers. Students may work together on the reading and vocabulary but each student should fill out his/her own answer sheet.

### **Ethics of Dissection Reading**

Working in groups of three or four, ask students to read one of the suggested articles – the one that takes the position opposite to the one they took. Those students who said they were undecided may choose to read either viewpoint. Of course, students should be encouraged to read both if they want to fully understand the different perspectives. Let students take turns reading aloud.

For homework, students should interview six people about their position on animal dissection and record their responses on an interview research sheet (for a sample, see the interview research sheet student guide). Four of the six people interviewed must be adults. Tell students to be prepared to share one of the interviews that they thought was the most surprising, persuasive, or controversial.

### **Explain**

Ask the students if any of them has changed their position based on the interviews. Reassign students to study groups that align with their position. Tell students they will participate in a graded discussion based on the following themes:

- *Is dissection an ethical activity?*
- *Is dissection an effective educational practice? Are alternatives available that are as effective?*

Give students time to answer these questions in their study groups. With about 5-10 minutes remaining, have each group write a one-sentence position statement and support it with their reasons.

### **Elaborate**

Before beginning the discussion, post the discussion themes and then explain the discussion format and how points are earned. Tell students you will help them begin the discussion but, after that, the goal is for them to respond to each other. Keep the rules simple; these rules will vary depending on the class discussion experience your students have.

Start off by asking a person from each study group to read a position statement. After the statements have been read, begin the discussion by asking the students who changed their original position due to the interview they conducted to share the argument(s) that convinced them.

### **Evaluate**

After the discussion, direct students to decide upon a final position and communicate their ideas by responding to this writing prompt:

I (choose one that supports your position:  
**believe / don't believe / am not sure**) that animal dissection should be conducted in Biology classes for the following three reasons...

While not intended to be a Five Paragraph Essay, this activity may be so adapted if you are working with an English teacher who will correct the writings.

#### **Focus Correction Areas**

1. Write in complete sentences that make sense. A complete sentence:
  - starts with a capital letter.
  - has end punctuation.
  - has a subject and a verb.
2. The paragraph begins with a topic sentence that answers the writing prompt.
3. The paragraph must have at least eight sentences.

The Focus Correction Areas (at right) can be taught in 10 minutes, are not time-consuming to correct, and can be adapted to the needs and writing level of the students.

## **Resources**

### **Websites**

*Responsible Use of Live Animals and Dissection in the Classroom* is a position statement about live animals and dissection in the K-12 classroom from the National Science Teaching Association

Available at <https://www.nsta.org/nstas-official-positions/responsible-use-live-animals-and-dissection-science-classroom>

The Foundation for Biomedical Research resource page on *Animal Testing Facts* offers brochures, posters, infographics, and other resources on this subject.

Available at <https://fbresearch.org/resources-foundation-for-biomedical-research/>

### **Video**

*I Care About Animals and People* at the Caring for All website. This video features researchers and medical personnel discussing laboratory animal research.

Available at <https://care.aalas.org/>

*The Ethics of Biological Studies with Living Organisms* course at Study.com has an introductory video to this subject. To watch the full video, you must create an account at <https://study.com/academy/lesson/the-ethics-of-biological-studies-with-living-organisms.html>

### **Game**

*Animal Care Adventures* is an app for iPhone or iPad

Available at <https://care.aalas.org/game-app/>

### **Dissection Concerns Article**

*Under the Knife: Animal Dissection as a Contested School Science Activity* by Jan Oakley

Available at <http://jps.library.utoronto.ca/index.php/jaste/article/view/21182>

### **Dissection Benefits Article**

*The Advantages of Actual Frog Dissection* by Lex Hubbard. Available from eHow at [http://www.ehow.com/facts\\_5718923\\_advantages-actual-frog-dissection.html](http://www.ehow.com/facts_5718923_advantages-actual-frog-dissection.html)