Animal Research
If Not, Then What?

Goal of Activity:

The goal of this activity/exercise is to ensure students understand the larger picture of the need for laboratory research animals, including the controversial issues, approaches to research, arguments against animal use, and the role of animal welfare, so they are able to comprehend the potential issues, concerns, importance, liabilities, and benefits.

Desired Outcomes:

Students will be able to:
1. Understand why animals are necessary in biomedical research
2. Understand the benefits and controversies of animal use in laboratories
3. Understand the health and economic benefits and potential liabilities of laboratory animal use and developing treatments using animals as a research models
4. Understand the necessity for biomedical research, and the limits necessary in medical care

Procedure:

1. Introduce the goal of the activity to the students and briefly discuss the importance of investigation and experimentation.
2. Ask students what they have heard about cloning and have them discuss/list the sources of their information.
3. Review the Societal Statement by having one student read it aloud.
4. Review the Key Terms with students.
5. In order to get the students to make informed decisions based upon facts, ask them if they are concerned about controlling the process of science, encouraging the development of new research methodologies, and effective disease treatment. Record where students stand on these issues and note whether the students believe if the stated problem is a top priority to alleviate or solve in their opinion.
6. Find out what the students know about animals in medical research. Stress the difference between cosmetic testing with animals and medical research with animals. Ask them whether they are pro or con on the topic. Record the students' positions.

7. Assign each student the task of finding two articles on Google about animals in medical research and their role in drug development. (The California Society for Biomedical Research and the National Institutes of Health are two sources for articles). This is also a good opportunity to discuss the importance of obtaining information on the internet from reliable sources.
8. Divide the class into sections and assign one or two key terms to each group to define and report back to the class.
9. After researching definitions, have the students read the definitions assigned to them out loud.
10. Have the students read each of the student questions aloud and allow students to respond to each question. Allow the students to express the pros and cons of their argument.
11. Ask whether any students have changed their minds regarding their opinion concerning the use of animals in general and specifically in biomedical research. If they have changed their opinion, ask the students what made them switch their position.

Societal Statement:

Results from animal studies are crucial for closing knowledge gaps about health and disease in both humans and animals. Understanding cell and organ function—which is similar in all vertebrates—helps researchers design experiments to test new treatments in people. Knowing that lab animals are treated respectfully, responsibly and as humanely as possible strengthens our understanding – as does separating perceptions from reality.

Key Terms:

- In vitro
- In vivo
- Animal Model
- Pre-Clinical
- The 3 Rs
- Transgenic Mice
- Protocol
- Animal Welfare Act
- Disease models
- Animal Welfare
- FDA

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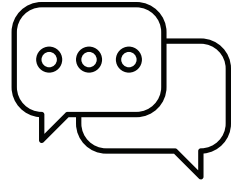
Discussion Questions:

1. Why is it important to remove/ eliminate diseases/illnesses?

2. What are the general steps/scientific processes/research involved in developing a cure for a disease?

3. Select an illness or disease and answer the following questions concerning that disease.

   A. How many people are affected by the disease/illness?

   B. Is the disease/illness fatal?

   C. What broad areas of science, engineering, and technology (i.e., biology, chemistry, etc.) are involved in developing a cure for this disease/illness?

   D. Within the areas listed in question c, what type of expertise or skill sets are needed?

4. What data and methods would you use to identify a disease?

5. How would you know that a disease exists? Who would provide the information to the scientists/ researchers?

6. After identifying the disease, how would you know how the disease starts or forms? Would we investigate cells or animals at this stage? Why or why not?

7. After learning and observing how the disease forms, what would we do next?

8. In the process of testing potential cures for the disease or illness, when would you be ready to provide the cure to the general public? Under what conditions would you believe additional testing would be necessary to ensure the safety of the public?

9. How would you find out about your new drug's effect on other areas of the body, if testing was restricted to just the cellular level or computer models?

10. What types of animals, if any, would you use as part of your testing/research? Why?

11. If your friend had an illness for which there was no cure that was not prevalent in a large number of people, but over time would result in death, would you conduct animal research using animals with a shorter life span in an attempt to quickly determine how the disease attacks the body? Why or why not?

12. Would you take a newly developed medicine without knowing the potential effects on your body? How would you determine what the effects of the new drug are if you do not use humans as "volunteers"?

13. Should humans be used instead of animals? Who?

14. Do you believe that animal research should be used to combat new strains of known diseases, including a pandemic or to combat against the potential for biological warfare? Why or why not?