Lesson Plan

Learning objectives

1. Appreciate the need for open & honest dialogue on opinions regarding the use of animals in research.
2. Understand what it means to hold an animal rights, animal welfare, or animal exploitist viewpoint.
3. Understand the typical viewpoint held by those who participate in animal research.
4. Understand the role that the regulatory system plays in overseeing animal research.

Materials

- Computer
- Slide projector
- Audio connection
- Chalk or wipe board with writing implement
- Microphone (if necessary)
- Pointer/slide advance
- SHARE powerpoint slides
- Case studies for each species being used (Appendix I)
- Playing cards for small groups (if using, see Appendix II)
- SHARE species posters (if using, see Appendix III)

Set up

- Have a plan for breaking students up into randomized small groups. You may use groups that have been previously defined for the course or may assign groups specific for this activity.

- Have a plan for assigning a different species to each small group (each of which corresponds to a different case study). Individuals within each small group will also need to be assigned different roles to assume during the case study evaluation.

- Print and collate case studies (see Appendix I) so that they are ready to be handed out to each small group.

- Make sure the video files embedded in the SHARE powerpoint slides work on the computer you are using and that audio is connected before class starts.

LEGEND

Use our KEYS TO SUCCESS for great tips on improving the quality of the lesson.

The POWERPOINT ICON indicates points in the lesson where a slide has been provided to aid you in conveying a concept.

Our TALKING POINTS provide explicit examples of ways in which to accomplish a particular step in the lesson.

Keep your class on time with our TIME CHECKPOINTS.

KEYS TO SUCCESS

A great way to randomly separate students into small groups and assign roles is with the use of animal research “playing cards”. Each card contains a picture of a different species (their group assignment) on one side and a role assignment on the other side. Cards can be handed to students as they enter the classroom. See Appendix II for more information.
Lesson Plan

Activity

Basic Procedure
1. Illustrate the all or none nature of extremist viewpoints.
2. Introduce students to the three Rs of research.
3. Review the case study in small groups.
4. Summarize the case study questions.
5. Discuss the protocol amendment.
6. Summarize responses to the amendment.
7. Generate general research guidelines.
8. Introduce the IACUC.
9. Introduce the animal welfare viewpoint.
10. Viewpoints lie on a continuum.

Step 1: Illustrate the all-or-none nature of extremist viewpoints. 7 min

a. Poll students regarding the use of animals by humans using the series of questions listed below which can be answered with a show of hands.

- How many of you are wearing a belt or shoes made out of leather?
- How many of you have a pet at home?
- How many of you have taken over the counter medication like Tylenol or Aspirin in the last two months?
- How many of you eat meat?
- How many of you have been to a zoo in the last five years?
- How many of you have ever been vaccinated for a disease?

b. Ask the students what all of these questions have in common.

Animal research is a common answer (likely because the students know this is the topic of today’s class) but owning a pet, eating meat and going to the zoo have little to do with animal research specifically. Guide the students responses to reveal that each question addresses a way in which humans use animals.

If the students don’t pick up on it on their own, inform them that individuals who hold an animal rights point of view would say “no” to each of these questions (i.e., they do not support leather goods, pet ownership, meat eating, etc). This will help segue into the next step: addressing the all-or-none nature of extreme viewpoints.

c. Inform the students that today’s goal is to illustrate that opinions about the use of animals for human benefit lie along a continuum and that any given individual’s opinion doesn’t have to be all-or-none like we see on the extreme ends.
d. Introduce students to the extreme viewpoints regarding the use of animals by humans.

Individuals who hold an animal rights point of view believe that animals have the same rights as humans. On the other end of the continuum are animal exploitists who believe that animals have no rights whatsoever and it is acceptable for humans to use animals in any way (without regulation).

e. Use the videos supplied on slides 2 and 3 within the SHARE powerpoint slides to illustrate the extreme viewpoints in a captivating and engaging manner.

f. Transition from the general use of animals by humans to the specific topic at hand, animal research, by polling students for their views on the use of animals in research.

Ask for a show of hands for those for, against or undecided about animal research. Be sure to summarize the choices before voting or students may not vote for “undecided” when it is unexpected as an option.

g. Ask students to provide you with some of the arguments in support of and opposition to animal research.

Use probative questions to ensure students mention the arguments that are most easily addressed using the three Rs to allow for an easy segue between steps 1 & 2.

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**Step 2: Introduce students to the three Rs of research. ** 7 min

a. Use slide 4 from the SHARE powerpoint slides to help you introduce the three Rs of research to the group.

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**Step 3: Review the case study in small groups. ** 7 min

a. Ask students to divide into small groups of 4-7 if they have not already done so. See Appendix II for a time saving method of separating your students into groups ahead of time.

b. Distribute the case studies to each small group.

Make sure to use at least 3-4 different case studies (using 3-4 different species) in any given class. Make sure you deliver the correct case study to each group. Do not draw attention to the fact that different groups’ case studies are identical with the exception of the species utilized for the research.
TALKING POINTS .................................................................

STEP 1.g.

Students frequently offer the benefit to human health as the most notable argument in support of animal research. To ensure they also consider the fact that findings from animal research can also benefit other animals, ask students leading questions like those listed below.

- Does anyone else benefit from animal research?
- How many of you have ever taken your pet to the vet? Have you ever had your dog or cat spayed or neutered? Did they undergo anesthesia?
- Do your pets get vaccines?

Students frequently offer the pain and cruelty involved in animal research as the most notable argument in opposition to animal research. Ensure that they also consider animals’ inability to provide consent, available alternatives to animal research, and the likelihood that findings from any given animal will translate accurately to the human condition using some leading questions like those listed below.

- Has anyone ever participated in a human research project? What do you have to do before you begin participating in the research? How do animals consent to participate in research?
- Are there any alternatives to animal research? What about doing research with humans instead? What about computer models? Can they replace the need for animals?
- How can we affect human health through research on something as small as a fruit fly? Are rats similar enough to humans to make research on them worthwhile?

TIME CHECKPOINT

Check the time! Students do best with ~7 mins to complete this exercise but time can be extended or shortened based on how much class time you have remaining.

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Check the time! Students do best with ~7 mins to complete this exercise but time can be extended or shortened based on how much class time you have remaining.

Inform students that they have also been assigned a role to play during the group discussion.

Assign students within each group roles as either scientists, veterinarians, or community representatives. Use slide 5 from the SHARE powerpoint slides to aid you if you are making use of the SHARE playing cards described in Appendix II.

Make sure at least one person in each small group represents each of the three different roles. Ask students to bring their own opinions to the table when discussing the questions below the case study but also to consider the concerns associated with the roles they have been assigned (e.g., a veterinarian is mostly concerned for the health of the animal).

Leave slide 6 from the SHARE powerpoint slides up for viewing so that students can refer to both their assigned roles and the three Rs as they evaluate the case study.
d. Allow the students a few minutes to work in their small groups. Follow up during the small group discussion period by checking in with each group and providing guidance when necessary to keep them on task.

**Step 4: Summarize the case study questions.**  
15 min

a. Ask one member of each group to be the group’s representative, or spokesperson. If you are making use of the SHARE playing cards describe in Appendix I you can easily designate the group member with the letter “A” on the back of their card as the group representative.

b. Cherry pick groups to call on to report their answers to each of the questions provided below the case study.

c. Once a particular group has provided a response, ask the rest of the class if they had different answers or anything new to contribute.

d. Use the students’ responses as a jumping off point for further discussion about the topic related to each question in the case study. Continue the discussion until all major concepts are addressed.

e. For the final question regarding approval, call out each group and ask them to report whether their group would approve or deny the protocol or if there was a split or ongoing disagreement within the group. Note their responses on the board at the front of the class so that they can clearly see any species differences that are unveiled.

**Step 5: Discuss the protocol amendment.**  
2 min

a. Ask students to return to their small groups for 1-2 minutes to review the protocol amendment described on slide 7 of the SHARE powerpoint slides.

Be sure to inform the students that they should assume any issues they had with the original protocol were adequately addressed (in other words, they shouldn’t conclude that the amendment should be denied simply because they would have never approved the original protocol).
Lesson Plan

TALKING POINTS

STEP 4.d.

Question #1: How is the proposed research important?

Core concepts:
1. Caffeine is the most highly used drug in the world so understanding its effects on our body could be important and informative.
2. Understanding how caffeine affects memory could help us understand more about the mechanisms behind memory formation.
3. Depending on its effects, caffeine could be used to treat memory related diseases that currently have little to no effective treatments (i.e., Alzheimer’s Disease, PTSD).

Guide students to uncover these core concepts using probative questions like the ones below:
- Why do we care about what happens when we have caffeine?
- Do a lot of people have caffeine? How many? How much? How often?
- Why would anyone be interested in researching memory?
- How would understanding more about memory help humans?
- Can you think of any memory-related diseases that afflict humans?
- If research shows that caffeine affects memory, how could this information about used to help humans?

Question #2: What additional information do you need to make your decision?

Core concepts:
1. Dr. Smith must provide more detailed information to allow for an accurate evaluation of this research proposal that includes but is not limited to details regarding the scientific significance of the study, research hypothesis(es), experimental design, appropriateness of the animal of choice, animal care and husbandry and how animals will be treated at the conclusion of the study.

Guide students to uncover the specifics of this concept by using probative questions like the ones below:
- How many animals does Dr. Smith say he needs?
- How is the caffeine being administered? What type of injection method is being used?
- Will animals be housed together or individually?
- How many caffeine injections will be required? How often?
- Will environmental enrichment be provided to study subjects?
- How does Dr. Smith justify the use of this particular animal for his study?
## TALKING POINTS .............................................................

### STEP 4.d. (cont.)

**Question #3: How are the three Rs of research relevant to your evaluation of this proposal?**

**Core concepts:**

1. Dr. Smith should use only as many animals as necessary to achieve statistical significance (Reduce)
2. The study could be refined to minimize pain and distress to the animals by changing the route of caffeine administration in particular.
3. Depending on the animal model being used, Dr. Smith may be able to replace his proposed subjects with an equally appropriate but phylogenetically lower species.
4. Informative data may be obtainable from a human population avoiding the need for animal research altogether.

Guide students to uncover these core concepts using probative questions like the ones below:

- How many animals does Dr. Smith say he needs? What would be an unacceptable sample size?
- Is there any aspect of the proposed study that could be painful or stressful to the animals?
- Has anyone here ever received an injection (intramuscularly, intravenously, etc)? Did it hurt?
- Is there an alternative to administering the caffeine via injection? We are modeling the human condition here. How do humans typically administer caffeine?
- Do you think findings from fruit flies will be reflective of the human condition? Would you expect different research results if the study was done in rats versus monkeys?
- Could we just use humans for this study? Why or why not? What if the study required subjects who had never been exposed to caffeine before? Are there any other variables that can affect memory in humans (i.e., diet, sleep, etc)? How can we control for those things in a human study?

### Step 6: Summarize responses to the amendment.  

**3 min**

a. Quickly go through each group’s response to the amendment noting them on the board next to their responses regarding approval of the original protocol.

b. Point out any changes in approval that occur as a result of the amendment and discuss with the class why this might be the case.
**Lesson Plan**

**TALKING POINTS**

**STEP 4.e.**

Ask different groups about how they came to the conclusion they did regarding their approval of the protocol. Compare responses between those groups that did and did not approve the protocol to identify reasons why species differences are important.

For example, the fruit fly group may not have approved the protocol because they were skeptical that this animal model would provide any useful information regarding the human condition. Conversely, they may have approved it because they aren't concerned about what researchers do with fruit flies. Similarly, the monkey group may not have approved the study because it seemed unnecessary to use this species when they could probably achieve similar results using a rat. On the other hand, they may have approved it because monkeys are the most likely species to accurately model humans.

**Step 7: Generate general research guidelines.  15 min**

a. Ask the students to generate general guidelines for research. In other words, ask them if they can identify any kinds of research that they feel could be automatically approved or denied.

   Play devil’s advocate during the discussion. As students make their suggestions ask the rest of the class if they agree or disagree with what has been proposed.

b. Conclude by pointing out that agreement among the class is difficult. It turns out that approval or denial of a research protocol really depends on the specific circumstances. It is not black and white but mostly a grey area that requires constant evaluation.

**Step 8: Introduce the IACUC.  7 min**

a. Inform students that there is a governing body that does exactly as was just discussed when trying to evaluate the proposed research in the case study and make generalizable research guidelines.

b. Introduce the concept of the Institutional Animal Care and Use Committee (IACUC) using slide 8 of the SHARE powerpoint slides to highlight its definition, the kinds of people that serve on an IACUC and their regulatory role in animal research.

Be sure to inform students that an IACUC is required by law for every animal research institution in the country, and that every IACUC struggles, just like they did, to determine whether individual animal research protocols are necessary and should be approved.
**TALKING POINTS**

**STEP 6.b.**

Ask different groups how they came to their decision. Why did their approval status change or remain the same?

For example, the rat group may have approved the protocol on both occasions because they felt that the research was worthwhile and that the cost of the rat’s life was worth the potential benefit of the obtaining the research results. In contrast, the dog group may have changed their mind and denied approval of the protocol following Dr. Smith’s amendment because they did not feel that the research findings were of enough benefit to warrant killing a dog.

Discuss with the class why these species differences exist using probative questions like the ones below:
- What would you do if you saw a fly or rat in your house?
- What would you do if you saw a dog running across the road?
- Can you find lots of pigeons in the wild? What about monkeys? Where do scientists get the animals they use for research?

**Step 9: Introduce the animal welfare viewpoint.** 6 min

a. Continue with slide 8 of the SHARE powerpoint slides. Emphasize that, in general, those involved in animal research including and especially those that sit on an IACUC are concerned for the animal’s welfare.

b. Reiterate again that opinions about animal research lie on a continuum but that the animal welfare point of view lies somewhere in the middle between the extremes.

Rather than believing that animals have the same rights as humans or no rights at all, animal welfareists believe in the use of animals by humans but not without strict regulation to ensure the welfare of animals. They believe that humans are morally obligated to ensure that animals are used in the most humane and responsible way possible.

**Step 10: Viewpoints lie on a continuum.** 6 min

a. Summarize again the extreme viewpoints regarding the use of animals by humans using slide 9 of the SHARE powerpoint slides.

b. Use slide 10 of the SHARE powerpoint slides to emphasize that while these extreme views are often the loudest, in truth, opinions about the use of animals by humans like along a continuum with animal welfare somewhere in between the extreme ends.

Remind students that the goal of today’s class has been to help them understand what the meaning of each of these viewpoints is and where they lie on the continuum.
c. Use slide 11 of the SHARE powerpoint slides to emphasize that opinions about the use of animals by humans can be parceled out into separate entities, each one to be decided upon individually.

Provide examples of how it is perfectly acceptable for any given individual to be in support of some uses of animals by humans but not others. For example, it would be some may feel it is okay to own a pet, not support the fur trade, and not eat meat but support animal research or, perhaps support sustainable hunting and fishing and the use of animals in research but not the use of animals for entertainment purposes or, is willing to wear and eat animal products but does not support animal research or the products that come from it.

d. Use any remaining time to emphasize that supporting something is not the same as participating in it just as being opposed to something is not the same as rallying against it.

An individual may be supportive of animal research and the benefits it provides humans but does not want to actually perform the research themselves. Likewise, an individual may be opposed to animal research and feels it is unnecessary but does not approve of burning down research labs or threatening the lives of animal researchers.

**TALKING POINTS .................................................................**

**STEP 7.a.**

Students may struggle at first to understand what you are asking of them during this exercise. Prompt them by asking very broad guiding questions like the ones listed below:
- Are there studies using any particular species that you think should be automatically approved (i.e., worms, flies) or denied (i.e., monkeys)?
- Are there any particular research methods that you think would warrant automatic approval or denial of a project?

Once it’s clear that students understand what you’re looking for they will begin offering various examples. Remember to facilitate an unbiased discussion during this exercise and refrain from providing your own opinion. Below are several examples of types of research students commonly mention during this portion of the class accompanied by probative questions that will guide students to address all sides of the issue.

As each of these issues (or others) is mentioned remember to first ask the rest of the class if they agree or disagree with what has been proposed.
TALKING POINTS ……………………………………………………

STEP 7.a. (cont.)

1. Research using endangered species should be automatically denied.
   o What about research using chimpanzees?
   o If an endangered species already exists in captivity should they be allowed to be used for research to benefit humans?
   o If chimpanzees were the only species available to find a cure for infectious diseases like Hepatitis C or HIV/AIDS would that justify their use?
   o Can researchers find a suitable alternative to using an endangered species?
   o Should captive chimps be reintroduced to the wild or retired to animal sanctuaries because of their endangered status?

2. Behavioral research that is “noninvasive” like observational studies should be automatically approved.
   o Are there circumstances where simply not handling the animal means the study is noninvasive?
   o Can you think of any species that might be uncomfortable being observed?

3. Terminal research on any particular species should be automatically denied.
   o Are there any circumstances where the death of a particular animal is warranted given the potential research findings?
   o Can you think of any devastating diseases that affect millions of people that, if a potential cure could be discovered, would warrant the death of some animals for research?
   o Are there some species that this rule may not apply to and others that it should (i.e., rats versus monkeys)?

4. Any research involving rats should be automatically approved because rats are disgusting and hugely overpopulated.
   o Where do rats used for research typically come from?
   o What would you do if you found a rat in your home?
   o Should a rat protocol that involves unnecessary and significant pain and distress (i.e., surgery in the absences of anesthetics or analgesics) be approved?
   o Has anyone ever owned a rat as a pet or known someone who has? How would they feel?

5. Research involving pain to the animal should be automatically denied.
   o How much pain is too much?
   o Are some types/levels of pain acceptable?
   o What about studies that are trying to identify and develop better treatments for pain in humans?
   o Does anyone have or know someone with a chronic pain disease or disorder?
   o Would people with pain disorders benefit from new and improved drugs to treat their diseases?
Appendix I

Case studies

The small group discussions that evolve out of the case study evaluation are the core of the SHARE activity. It is here that students have the opportunity to express their opinions and debate with their peers about the use of animals in research. Each of the case studies provided on our website describes the same research project but involves a different species. This set up allows students to generate a unique dialogue within their groups as they are initially unaware that all case studies are the same, but then allows them to come together as a large class to discuss the major concepts. It also allows for the identification of species differences – an important concept to highlight.

You can use the case studies provided on the website for grading, attendance or participation for your class, or use it as a non-graded guiding tool. Regardless of whether you will be asking students to hand in their notes, we recommend that you print enough case studies for everyone to have a copy. Make sure that you print the appropriate number of each animal so that students receive the case study that belongs to their animal and not any other.

Please review the experimental proposal provided below as a group.

Experimental proposal

Dr. Smith, a scientist at your research institution, would like to conduct an experiment investigating the effects of caffeine on memory using dogs. Would you approve of his research proposal? He plans to inject different biologically relevant doses of caffeine into the dogs and then conduct behavioral observations on each individual as they find their way through a maze apparatus. Dr. Smith has extensive experience in this kind of research protocol and has laboratory space to house the dogs appropriately.

Please discuss the following questions as a group and note your answers below.

1. How is the proposed research important?

2. Do you need additional information to make your decision? If so, what information is required?

3. How are the three R's of research (reduce, refine, replace) relevant to your evaluation of this research proposal?
Appendix II

Playing cards

SHARE works best in randomized small groups. Friends can be reluctant to express differing opinions with each other in a group setting, or their similar points of view may be what makes them such good friends. Randomly assigning students to small groups reduces the likelihood that groups of friends will join in discussions together.

A great way to assign students to groups randomly while also assigning them a species and role to assume during small group work is the use of SHARE’s animal playing cards. These cards can be printed and provided to students ahead of class or handed to students as they enter the classroom. The use of large posters advertising the different species assigned to each group spread throughout the classroom allows for immediate sorting of students into their small groups and reduces class time spent rearranging large groups of people – something that is particularly important for short class times and/or large class sizes.

The number of species you will need to use will depend on the size of your class. We recommend splitting students into groups of 5-7 individuals.

Small classes (~10-70 students)

- Use the cards without borders.
- Classes of 60-70 students will need to use all 10 species provided.
- Classes of less than 60 students will not need to use all 10 species. When this is the case instructors should choose animals from the list that span the phylogenetic tree so that species differences regarding animal research guidelines can be easily illustrated. For example, a class of 30 students can easily be split into six groups of five students each assigned to the following species: roundworm, fruit fly, rat, dog, sheep, monkey.

Medium classes (~71-200 students)

- These classes will require more than 10 small groups. Cards with colored borders allow you to separate students based on species and color (i.e., green monkey, red monkey, blue monkey).
Appendix II

- Determine how many small groups you will need based on class size and print two or three colors of cards.
- Ask students to sit with their species and color (i.e., red monkey).

Large classes (>200 students)

- Use multiple copies of each of the sets of cards with colored borders.
- Ask students to sit with their species and color (i.e., red monkey). Then ask students to split off again into smaller groups. You can simply ask students to split their group in half (i.e., two red monkey groups) or thirds depending on group size.
- For very large classes it may be worth considering splitting students into groups prior to class day (i.e., the class period before the SHARE activity) to avoid confusion and disorganization on the day of.
Appendix III

Large posters

It may be helpful to plant large posters advertising the species assigned for small groups throughout the classroom to facilitate quick and easy division of students during the case study portion of class. You can ask students to move to their assigned animal once the case study portion of class begins or ask students to sit next to the poster with their animal on it as they enter the classroom at the beginning of class (recommended for larger class sizes).

Click here to download high-resolution images of each of the SHARE species.
SHARE powerpoint slides

The SHARE powerpoint slides have been converted into a pdf for your reference as you go through the lesson plan. To download a copy of the SHARE powerpoint presentation click here.
Speaking Honestly –
Animal Research Education
Animal Rights Viewpoint
Animal Exploitist Viewpoint
Three Rs of research

1. **Reduce** the number of animals needed for the experiment to obtain statistically relevant data.

2. **Refine** the experimental procedures to minimize pain and distress.

3. **Replace** animals with phylogenetically “lower” species or even computer models when scientifically valid results can still be obtained.
Case study roles

• Bring your own viewpoints to the table
• Also consider the views of your assigned role:

  A & B = Veterinarian – primarily concerned about the health of the research animal

  C & D = Scientist – primarily concerned about the quality of the data collected from the research animal

  E = Community representative – does not hold a stake in the research outcome; represents the concerns of the general public
Discuss the questions below the case study

Three Rs of research

1. **Reduce** the number of animals needed for the experiment to obtain statistically relevant data

2. **Refine** the experimental procedures to minimize pain and distress

3. **Replace** animals with phylogenetically “lower” species or even computer models when scientifically valid results can still be obtained.

Assigned roles

**A & B** = Veterinarian – health of the animal

**C & D** = Scientist – quality of the data

**E** = Community representative – no stake in outcome; represents public
Dr. Smith is amending his research proposal. He would like to examine cells in the area of the nervous system responsible for memory. This will require that he euthanize the animals.

Assume Dr. Smith adequately addressed all of the issues you discussed in the original proposal.

Does this change the outcome of your evaluation?
Institutional Animal Care and Use Committee (IACUC)

- Consists of at least 5 members
  - Veterinarian
  - Scientist
  - Non-scientist
  - Affiliate (member of community)

- Roles
  - Review & approve or deny all proposed animal research
  - Inspect research facilities at least twice/year
  - Monitor projects for compliance
Extremists

**Supports animal rights**
- No pets
- No hunting
- No furs
- No animal products
  - Leather
  - Meat
  - Medications
- No animal research
- Animal rights = human rights

**Supports exploitation of animals**
- Hunts for pleasure
- Avid fisherman
- Supports non-sustainable fur production
- Supports the use of animal products
  - Leather
  - Meat
  - Medications
- Supports animal research without consideration of three R’s
- Animals have no rights
Opinions lie on a continuum
It doesn’t have to be all-or-none

Animal rights

Animal welfare

Animal exploitation

YOU?
Opinions lie on a continuum
It doesn’t have to be all-or-none

Animal rights

Eat meat

Wear leather/fur

Own a pet

Hunt/Fish

Take medications

Support animal research

Use animals for entertainment

Animal exploitation

HECK NO!
- Eat meat
- Wear leather/fur
- Own a pet
- Hunt/Fish
- Take medications
- Support animal research
- Use animals for entertainment

ABSOLUTELY!
- Eat meat
- Wear leather/fur
- Own a pet
- Hunt/Fish
- Take medications
- Support animal research
- Use animals for entertainment