

Spring 2020

Development of Secondary Agriculture Education Research Animal Lesson Plans That Incorporate AFNR Animal Systems Career Pathway Standards

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Development of Secondary Agriculture Education Research Animal
Lesson Plans That Incorporate AFNR Animal Systems Career Pathway
Standards

by

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A creative component submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE.

Major: Agriculture Education and Studies

Program of Study Committee:

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2020

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ACKNOWLEDGMENTS

I would like to sincerely thank my major professor Dr. Scott Smalley for his patience and willingness to allow me to work on this creative component at my own pace in addition to the invaluable guidance he has provided throughout my undergraduate and graduate career. I would also like to thank my committee members, Dr. Misty Lambert and Dr. Amanda Baker, for their guidance and support throughout my graduate career.

In addition, I would also like to thank my parents, Rose and J.B. as well as my sisters Erin and Julia for their continued encouragement as I pursued this degree. For being among the first to support my decision to go into education, I would like to have a special thanks for my late dad, Rod Lee. Finally, I would like to thank my friends and all of the faculty members of Iowa State University who have helped bring me to where I am today for their support as well. All of you have helped to make my time at Iowa State a wonderful experience and I am truly grateful.

ABSTRACT

Animal research has played a vitally important role in today's society, regardless of the opinions behind it. However, educational lesson plans regarding animal research at the secondary school level have been virtually non-existent. This creative component looked to bridge that gap by creating two correlating lesson plans: (1) explaining the history of animal usage and regulations in research settings and (2) delving into United States legislation that looks to preserving welfare in research settings and developing new legislation that would further enhance animal welfare. The lesson plans were developed utilizing the theory behind Bloom's taxonomy, and include national AFNR standards that are pertinent to each.

CHAPTER 1. INTRODUCTION

The overall intent of this creative component was to create lesson plans about animal research in the United States. In looking at various animal science curriculums offered by schools throughout different states in the country, it became evident to me animal research was not a topic that was discussed much in the classroom. While some people may wonder why such lesson plans are needed to be taught in the first place, I would like to pose the argument that agriculturalists are discussing with consumers more often as to why it is important for agricultural educators to teach their students about where their food and fiber comes from and why those industries are important. The same can be said for animal research, especially in this day and age where anthropomorphism is gaining traction and the anti-vaccine movement is becoming more prevalent across social media platforms. Recent events have also transpired which reignited the argument regarding the utilization of animals in research. Just as it is important for students to understand where the food in their grocery stores comes from and the management practices behind the care for the animal products, it is also important for students to understand where their medications, and vaccines, are developed from. In addition, it is important not only for students to understand where they come from but also the legislation that is in place to ensure research animals are being treated in an ethical manner.

The lesson plans in this creative component look to accomplish three main objectives. 1) Students will gain an understanding and appreciation of the history behind the legislation regarding research animal usage, 2) Students will be able to connect how legislation works to promote animal welfare in research settings and 3) Students will recognize different ways in which specific species are used in research settings and develop their own recommendations for legislation which they believe would further enhance welfare for research animals. In

accomplishing these three objectives it is hoped students will be better able to gain a more open-minded understanding when dealing with a sensitive topic such as using animals in research studies.

“If there is one thing children can learn about animals in school, it is the ways in which they provide countless contributions to the health, beauty, and lifestyles compromising the status quo” (Mueller, Tippins, & Stewart, 2017). Nothing truer could be said in how much of an impact animals have on our society today. Agricultural educators have much to do with helping to bridge the gap between farm and food for consumers to understand, but time should also be taken to bridge the gap between research and the advancements we have today thanks to animals. The lessons plans in this project will help to promote an even greater appreciation for animals used in research as well as a greater understanding in why and how animals are used for research purposes.

CHAPTER 2. LITERATURE REVIEW

A gradual shift has occurred the past few decades where more and more species of animals are being viewed as companions for humans, resulting in them being treated like they are humans. Beyond the typical cats and dogs are pigs and cattle being kept as pets as well as “traditional” laboratory animals such as mice and rats. The companion animal industry alone rakes in an estimated \$75.38 billion annually, with \$31.68 billion being spent on nutrition and nearly \$40 billion for animal health and well-being (APPA, 2019). It is arguably because of the more anthropomorphic view that people have of animals now. Nearly 67% of homes in the United States have at least one household pet, an 8% increase from 56% of U.S. households in 1988 (APPA, 2019). No longer are barn cats being left to fend for themselves in terms of hunting mice and rats as their sole food source; now many people supplement them with cat food in addition to expecting that they continue to hunt the mice and rats that may plague fields and silos. The same can be said for dogs as it has become more common for dogs to stay indoors and share a bed with their owners.

With this shift in animals being viewed more as members of the family it has become popular in considering them as individuals who deserve the same rights as humans, in part because of certain animal rights groups. As a result, animal agricultural and research facilities have taken a hit with negative publicity and misguided information being construed to the public by such groups. Most recently, a major cosmetics brand called Wet n’ Wild came under fire for not being a true “cruelty-free” company when it was discovered their products were being sold in China. The term “cruelty-free” when used in the cosmetics industry means that those products are not tested on animals. Wet n’ Wild was accused of not being “cruelty-free” because China imposes strict regulations regarding its imported cosmetics market. The National Medical

Products Administration, or NMPA, in China oversees cosmetic regulations and requires that all cosmetic products have to be tested using animal testing, regardless if those products have been tested overseas (Shao, 2019). Only domestic cosmetic products may be waived from animal testing (Shao, 2019). Regardless of certain loopholes, those regulations can still have imported products be tested on animals. For a brand like Wet n' Wild that promotes "cruelty-free" products to be discovered selling in China, it caused a loss in consumer trust for the company and brought the question of whether animals should be used for testing and research purposes back into the spotlight. This also brings into question the validity of humans "owning" animals and using them for human purposes to better human lives, and some animal rights groups go so far as to desire for all animals to live completely free and independent of human interventions. This notion that all animals should be completely free of human interventions may be detrimental to domesticated species, including those that are raised specifically for research purposes, and has caused a disconnect of information between consumers and researchers. Education can help in bridging the gap between that disconnect.

Research utilizing animals has been around for thousands of years. The ancient Greeks believed that the worth of an animal was determined by how well they are of benefit to people (Mueller et. al, 2017). Aristotle elaborated further that while animals are worth as much as they are useful to humans, humans are also responsible for the well-being of the animals and should practice animal-centered ethics (Mueller et. al, 2017). Animal research grew in Europe during the 1600s, and by the 1800s people were using animal research as a way to figure out the cause behind certain medical conditions (Adam & Larson, 2019). One prevalent example from that time period is that the rabies vaccination was developed in thanks to research utilizing rabbits by Louis Pasteur (Adam and Larson, 2019). Without animal research, the world would look much

different today. We now better understand AIDS thanks to research now using mice as model organisms rather than the original chimpanzee model (Hatzioannou and Evans, 2015). We also have numerous vaccines to fight diseases such as polio and diphtheria developed in thanks to animal research (National Academy of Sciences, 1991). In addition, the reason we were able to develop and use advanced practices such as organ transplantation is because of research done on mice that allowed researchers to discover how rejections occurred in the animals and develop a way to combat that (National Academy of Sciences, 1991). Utilizing animals for research allows people to discover cures, life-saving surgical techniques, and treatments that would otherwise have been initially impossible to do. Model animals in research “forms a core of biological knowledge” that allows researchers to better understand diseases and conditions alike (Mueller et. al, 2017, p. 85). Animal research also improves the lives of other animals as well, helping to eradicate diseases and promote better management practices for species.

In the United States, early legislation regarding the usage of animals for research was largely handled by individual states (Adam and Larson, 2019). It wasn't until 1966 that the first iteration of the Animal Welfare Act, hereafter AWA, became the first federal law that regulated the use and treatment of animals in research settings (Mueller et.al, 2017). Interestingly, the AWA was only seriously considered and passed by Congress thanks to public outcry after Life Magazine publicized an article about family pets “disappearing” from their homes only to be discovered to have been taken and sold to be used in research facilities for studies (Adam & Larson, 2019). The AWA has been through a multitude of revisions over the decades since its inception, further refining and updating standards as more information regarding how to maintain animal well-being and ethically procure animals for research purposes became available. Other entities such as the Association for Assessment and Accreditation of Laboratory

Animal Care, hereafter AAALAC, and the Institutional Animal Care and Use Committee, hereafter IACUC, implement principles to go further beyond the federal regulations to promote and maintain high standards in caring for research animals (Speaking of Research, 2019).

It is important to understand in the United States today, using animals for research is many times considered a last resort as more and more alternative options are becoming available as technology evolves and improves. The three R's principle developed and published by R.L. Burch and W.M.S. Russell in 1959 became widely used across the research field (CCAC, 2019). The principles focus on alternatives, and the three R's are described as alternatives as to how to ethically use animals in research. The first R stands for replacement and focuses on "methods which avoid or replace the use of animals in an area where animals would otherwise have been used" (CCAC, 2019). Replacement could either mean replacing vertebrate animals with invertebrate animals because of a potential to experience lesser pain perception than humans, or replacing animals completely with computer or other technological alternatives. The second R focuses on reduction, meaning to use as few animals as possible in order to get adequate data, or maximizing the information gained from each individual animal used in the research setting without compromising the welfare of those animals (CCAC, 2019). Finally the third R focuses on refinement. In this instance, refinement refers to adjusting procedures to minimize distress and pain in the animals (CCAC, 2019). A fourth R has also been discussed as being part of the original three principles, and that is respect for the contribution research animals make in trying to answer a scientific question that hopes to better human or animal lives (Mueller et. al., 2017). Some scholarly articles include rehabilitation as one of the R principles as well, focusing on the aftercare of the animal post-experimentation (Mueller et. al., 2017). In a university research setting, such as at Iowa State, when principle investigators, hereafter PI's, are wanting to utilize

animals in their research they have to have that research approved by an IACUC. The IACUC committee will then determine whether or not animals are truly necessary for the success of the project and challenge the researchers to consider alternative solutions, whether that is using other technologies or reducing the initial amount of requested animals.

CHAPTER 3. METHODOLOGY

The lesson plans are structured in a way that follows the revised Bloom's taxonomy. Bloom's taxonomy was developed in 1956 by Benjamin Bloom and his collaborators as a continuum to help organize learning goals, ranging from gaining factual knowledge to building on that to develop metacognitive knowledge in students (Armstrong, 2019). While the lesson plans may be taught independently from one another, to experience the full range of the taxonomy used in them it is recommended that they be taught as a cohesive unit. The revised Bloom's taxonomy was used to create lessons which allow students to learn about basic concepts related to research animals and to further build on their initial knowledge to analyze and evaluate the industry, in essence building on their lower-level thinking skills to higher-level thinking skills. I appreciate how the taxonomy is structured and is easy to follow, with one aspect building off the last. The revised taxonomy was utilized when developing my lesson plans for this creative component because I believe it helps to create a cohesive unit, with one lesson building off on the next in a way that allows students to further enhance their learning experiences.

The first lesson developed focuses the first two bottom tiers of Bloom's pyramid, remembering and understanding. It centers on the history of research animal usage and legislation. In this lesson, students are asked to memorize various laws and dates and also understand the material by summarizing what they learned in the lesson for the exit ticket activity. In doing this lesson, students meet the criteria for the first two tiers of Bloom's taxonomy and can build on that for the second lesson that focuses on the application, analytical, and evaluation portions of the pyramid.

For the second lesson focusing more in-depth on the regulations and how they relate to animal welfare, students will expand on their cognitive skills in focusing on the application, analytical, and evaluation portions of Bloom's taxonomy. In this lesson, students are asked to look at an example animal research facility and interpret what animal welfare looks like in that setting (i.e. the application portion) and attribute that learned information to develop their own arguments for comparing and contrasting animal welfare methods in animal research settings (i.e. the analytical portion). Upon completion of the lesson, students are asked to determine for themselves if the current laws are doing enough to maintain animal welfare, or if more needs to be done to further ensure animals in research settings are being treated ethically. The last part relates to the evaluation portion of the taxonomy in which students are having to decide for themselves what they believe about the laws and defend their reasoning on whether changes should be made or not. Students are also asked to develop their own piece of legislation they believe would be beneficial to research animals, tying in the final portion of Bloom's taxonomy which is to create.

It is important for educators to note ethics related to animal welfare may be a touchy subject for some students. Certain students may already have their own opinions formed about using animals in research while others may be completely unaware of the practice. It is the duty of the educator to ensure the information presented is factual, relevant, and up-to-date, in addition to making the content area interesting to students. The lesson plans created incorporate methods to enhance student motivation to help them become more interested in the material, particularly when discussing the history of legislation related to animal research. Allowing students to discuss with one another their own thoughts and opinions helps to create a more inclusive environment. In addition, giving students some autonomy in choosing how they would

design their own piece of legislation or specification to promote better animal welfare gives them creative freedom to apply all that they have learned thus far.

CHAPTER 4. PRODUCT

History of Animal Usage in Research Settings Lesson Plan

Module or Course Title: Animal Science

Unit: Research Animals

Lesson: History of Animal Usage in Research Settings

Educational Goal: Students will be able to create a timeline of how animal research began and the legislation mandated by the federal government in the United States.

AFNR Standards:

AS.01.03.01.b. *Analyze the structure of laws governing animal industries, international trade and animal production policies.*

Objectives:

- Students will be able to memorize and recall key dates of legislation passed in the United States that continue to have an impact on animal research to the current day.
- Students will be able to create a summative timeline that includes key dates pertaining to animal research.

Resources and References:

- “Legislative History of the Animal Welfare Act” by the USDA located in the National Agricultural Library
- <https://www.vbivaccines.com/wire/louis-pasteur-attenuated-vaccine> - for information on Louis Pasteur’s work on vaccines he developed

Supplies and Equipment:

- A timeline will need to be drawn up on the board before the lesson begins.
- List of key dates with historical occurrence or legislation (instructor use only)

Estimated Time: 50 minutes

Safety: No safety precautions for this lesson.

Teaching Procedures:

Interest Approach:

Sticky Note Activity:

On the board, a timeline should be drawn for students to see. When students walk into the classroom, each should be given at least one sticky note with a key piece of legislation or historical information regarding. The instructor will ask each student to come up to the board to stick their sticky note underneath the year they think that piece of legislation was passed or when that aspect of history occurred. When students are done putting their sticky note on the board, they may pick up a blank piece of paper at the front and copy the timeline from the board onto their piece of paper to use as their notes sheet as the lesson progresses.

Content and Strategies:

What the Students See	Suggested Instructional Strategies
<p>Students will see a timeline drawn up on the board. The timeline is titled “History of Animal Research” and has certain dates written in chronological order above the line at certain points. Students will be expected to copy the timeline on the board onto their own as a study guide of sorts for them.</p>	<p>The instructor will need to draw up a timeline with the years on the board before class begins and have sticky notes written for the historical points or legislation. Here is the list of key dates that should be written on the board and sticky notes. Any notes that are italicized should be verbally discussed by the instructor rather than written on the board or sticky notes to help save room:</p> <ul style="list-style-type: none"> • Mid-300 B.C. – books written by Aristotle on purposeful animal dissection. <i>The books that Aristotle and the Ancient Greeks wrote regarding the usage of animals for human means are few and far between as few of them have survived to our modern era. Thanks to what has survived we are able to have a better idea of when people began using animals for research purposes in order to further knowledge on living functions and relating it to humans.</i> • Mid-100 A.D. – Dissections done by Galen provided knowledge on spinal cord functional similarities between humans and other mammals. <i>Galen was known as</i>

Galen the Physician in his time, and the term vivisection came about thanks in part to him using live animals for surgeries. The reason that Galen used animals for dissections was because at the time, Roman law strictly prohibited the use of dissections on humans. As a result, what Galen was able to glean from his research in relating his animal dissections to humans had some errors about human anatomy.

- 1543 – “birth of modern science”
- 1600s – animals used in research expanded in Europe. *This was a time where people were wanting more knowledge than what the churches could give them and wanting to gain a better understanding of how things work.*
- 1828 – 1898 – various states in the U.S. passed anti-cruelty laws. *Not all states at the time had anti-cruelty laws, and 14 of them during this time period actually exempted experimentation on animals. **Pose question to students: What does exempted mean?** Exemptions are like loopholes in the sense that it makes you free from liability.*
- 1876 – first national law that regulated using animals for experimentation passed in Britain; Cruelty to Animals Act of 1876; *Britain was concerned with animal welfare long before the United*

	<p><i>States began to take note and develop its own federal legislation.</i></p> <ul style="list-style-type: none"> • 1881 – Pastuer developed vaccine for anthrax thanks to successful testing with goats, cattle, and sheep • 1885 – Pasteur developed rabies vaccine utilizing research rabbits • 1966 – U.S. Animal Welfare Act (AWA) was passed; first federal law passed of it’s kind to protect research animals. <i>Ninety years after Britain had already passed its own federal law, the United States followed suit in passing this law. This law was passed because of an article written by Life magazine where a family dog was taken from its home and sold to a research facility, unbeknownst to the family. Public outcry for the fate of Pepper the Dalmatian spurred Congress into action to create the first rendition of the AWA. This law set the minimum standards for transport of animals across state lines and limited USDA intervention in research facilities at the time and only covered six species, including dogs, cats, hamsters, rabbits, guinea pigs, and nonhuman primates.</i> • 1970 – first amendment to AWA; expanded scope of animals covered and changed definition of “animal”. <i>Included all warm-blooded animals besides mice and rats. Instate transport was now monitored by the USDA as well.</i>
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	<ul style="list-style-type: none">• 1976 – second amendment to AWA; established standards for animal care during transport. <i>Graphic reports of animal deaths and treatment during transport was the reason for this amendment to be passed. It made standards to improve transport conditions, including feed and water, resting space, proper ventilation and temperatures as well as proper handling procedures. This all helped to ensure a higher caliber of animal care and improve animal welfare during transport.</i>• 1985 – Improved Standards for Laboratory Animals Act part of the Food Security Act passed; changed USDA jurisdiction over animal welfare in research settings; mandated IACUCs. <i>IACUC stands for the Institutional Animal Care and Use Committees that oversees animal usage at registered institutions. Iowa State University is one such institution. IACUC is responsible for ensuring that no other alternatives can be taken that might replace animals used in research and ensure that research animals receive the proper care and minimal pain in experiments. Exercise requirements for canines was added in with this amendment and became a minimum standard for caring for research colonies.</i>• 1990 – amendment to the AWA that covered pet theft. <i>All dogs and cats in shelters have to be held for a minimum of 5 days before they are</i>
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	<p><i>allowed to be sold to research facilities. It was made to allow pet owners time to reunite with their lost pets and give potential owners a chance to adopt the animal. It also made sure that shelter animals had proper documentation for record keeping purposes.</i></p> <ul style="list-style-type: none"> • 2002 – amendment to the AWA now covers mice, rats and birds. <i>The definition for warm-blooded animals in the 1970 amendment was further expanded on to include mice, rats and birds after the USDA was sued in 2000. However, birds, rats from genus Rattus and mice from genus Mus that are used for breeding purposes are still not considered “animals” according to the AWA.</i> • 2007 – amendment to the AWA that prohibits intentional selling, transporting, etc. of animals intended for fighting. <p>To better aid students that may not be sitting up close to the front of the classroom where they would more easily be able to read the sticky notes, the instructor may choose to read out loud what is written on the sticky note and/or write on the board in larger handwriting what is written on the sticky note.</p>
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Summary and Review:

At the end of the lesson, the instructor should review with the students the important dates and pieces of legislation and address any questions that students may have. The instructor should summarize the timeline and explain the importance behind how animal research got to where it is today. Ask students to write a quick 3-5 sentence summary of what was discussed in the lesson as an exit ticket before doing the evaluation portion of the lesson.

Applications:

To help with the memorization of the dates, students will be filling out their own timelines as the lesson progresses. The instructor will move the sticky notes students had previously placed

during the interest approach activity to its proper place, if it not already there, and provide further explanation and/or background information on that date.

Evaluation:

In the last five minutes of class, the instructor will ask the students to put their timelines away. The instructor will then randomly hand out the sticky notes to students again, at least one per student. Each student will then need to put their note under the corresponding year that piece of legislation was passed or when that historical occurrence happened. This will help to determine if the information portrayed in the lesson was stored into students' heads and give the instructor a clearer idea of the understanding of the class as a whole.

Research Animal Welfare and Regulations

Module or Course Title: Animal Science

Unit: Research Animals

Lesson: Research Animal Welfare and Regulations

Educational Goal: At the end of this lesson, students will be able to differentiate between animal welfare and animal rights, and discuss what animal welfare looks like in a research setting.

AFNR Standards:

AS.02.01.01.a. *Explain the implications of animal welfare and animal rights for animal systems.*

AS.02.01.01.b. *Design programs that assure the welfare of animals and prevent abuse or mistreatment.*

Objectives:

- Students will be able to define animal welfare and animal rights, and differentiate between the two.
- Students will be able to identify legislation related to animal welfare in a research setting.
- Students will discuss strengths and weaknesses in critiquing the current Animal Welfare Act.
- Students will create and produce their own recommendations for amendments or changes to be made to the current Animal Welfare Act.

Resources and References:

Recommended but not required:

- “USDA Animal Welfare Act and Animal Welfare Regulations” book (2017) OR online PDF available at <https://naldc.nal.usda.gov/download/5969370/PDF>. Specifically focus on Part 3 – Standards and pages 111 – 240 for the correlating assignment.

Supplies and Equipment:

- Interest approach activity PowerPoint (included with this lesson)
- Large cards with either a large “R” on it or a large “W” on it. There will need to be enough cards for all the groups or pairs.

Estimated Time: Two 50-minute class periods

Safety: No safety considerations for this lesson.

Teaching Procedures:

Interest Approach:

Animal Welfare vs. Animal Rights Statements Activity:

Students will need to be put into small groups (no more than four students per group) or pairs. Each group or pair will need two cards: one with a big “R” to represent animal rights and one with a big “W” to represent animal welfare. The teacher will read through each statement one at a time. Students will be given ten seconds to discuss with their partner(s) if that statement correlates more with animal rights or animal welfare and hold up the corresponding card. Once all groups or pairs have answered, the teacher can click on the slide to show the answer. This interest approach is to help gauge what students may already know about animal rights and animal welfare and give them an introduction to what they will be covering for this lesson. This activity will take 3-5 minutes.

Slide	Corresponding Explanation
<p data-bbox="240 926 659 1024">ANIMAL RIGHTS VS. ANIMAL WELFARE</p> <hr/>	<p data-bbox="824 821 1365 890">(Introduce the activity and assign students into groups or pairs.)</p>
<p data-bbox="228 1318 391 1350">Instructions</p> <ul data-bbox="228 1373 760 1545" style="list-style-type: none">• Each group/pair will have a two cards, one with a big “R” to represent animal rights and one with a big “W” to represent animal welfare.• After the teacher reads the prompt on the board, the the groups/pairs will be asked to either hold up the “R” or the “W” to indicate if the statement pertains to animal rights or animal welfare.	<p data-bbox="824 1268 1377 1409">(Explain the instructions that students have about the activity and ensure all students understand what they are to do for the activity.)</p>

<p>Statement 1:</p> <p>Animal usage by humans for any means (food, fiber, etc.) is considered exploitation.</p> <p>RIGHTS</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p> <p>Pose question to students: <i>What does exploitation mean?</i></p> <p>“The action or fact of treating someone unfairly in order to benefit from their work. The action of making use of and benefiting from resources.” (Oxford dictionary, 2020)</p> <p>In addition, using animals for work or as pets is also considered exploitation under animal rights.</p>
<p>Statement 2:</p> <p>Humans are responsible for providing care for duration of animal’s lifespan.</p> <p>WELFARE</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p>
<p>Statement 3:</p> <p>The Five Freedoms</p> <ol style="list-style-type: none"> 1. Freedom from hunger and thirst. 2. Freedom from discomfort. 3. Freedom from pain, injury, or disease. 4. Freedom to exhibit natural behaviors. 5. Freedom from distress or fear. <p>WELFARE</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p>

<p>Statement 4:</p> <p>Organizations such as PETA and HSUS.</p> <p>RIGHTS</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p> <p>These two organizations are animal rights groups, with members called animal rights activists. Other smaller organizations such as these also exist, but PETA and HSUS are two of the largest ones.</p>
<p>Statement 5:</p> <p>The 3 R's of Animal Research</p> <ol style="list-style-type: none"> 1. Refinement 2. Reduction 3. Replacement <p>WELFARE</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p> <p>The three R's of animal research were developed in 1959 by Burch and Russell in their book "The Principles of Humane Experimental Technique" (CCAC, 2019).</p>
<p>Statement 6:</p> <p>Animals = Humans</p> <p>RIGHTS</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p> <p>The concept that animals are equal to humans means that animals deserve the same legal and ethical rights that humans have.</p>

<p>Statement 7:</p> <p>Humans have the right to own animals.</p> <p>WELFARE</p>	<p>(Read the slide to students and give them 10 seconds to confer with their partner(s) and hold up cards.)</p> <p>This one is kind of trick question because of the word “right” in the statement. Remember earlier when discussing animal exploitation and what that meant? Part of what is considered animal “exploitation” is the notion of owning pets, whether that be as pets or for production purposes.</p>
<p>HOW DID YOU DO?</p>	<p>(Check in with students to see how they did, and answer any lingering questions that they may have regarding the activity. Pick up the cards from students.)</p>

Content and Strategies:

What the Students See	Instructor Notes
<p>After the interest approach activity that gives an introduction to what animal welfare looks like in general, the lesson will progress onto looking more in-depth at the AWA. Students will need to be divided into four groups to accomplish this task. A sheet explaining the activity is attached to this lesson plan for students to utilize. The students will have one class period to put together</p>	<p>This is a two-day lesson. On the first day, the interest approach activity will be done and students will be introduced to their groups for the collaborative learning activity. Each group will need a copy of the USDA Animal Care Animal Welfare Act and Animal Welfare Regulations guide or a printout copy of their assigned subparts for them to use for group project. The instructor should divide the students into four groups, each group being responsible for the following subparts in the guide:</p> <p>Group 1 – Subpart A (pages 111 – 136) Group 2 – Subpart B (pages 137 – 152)</p>

	<p>Group 3 – Subpart D (pages 165 – 190) Group 4 – Subpart F (pages 229 – 240)</p> <p>As the students are working on their group summaries, the instructor is encouraged to be providing assistance to students as-needed and guiding them in the process of working on their summaries. They may also recommend other sources that may also be used, but students should be encouraged to primarily use the guide. As they work on their summaries, students should be thinking about what they initially know and have learned about animal welfare and how that pertains to what their group’s subpart discusses.</p> <p>On the second day, the first ten minutes of class should be given to the groups to finish up their summaries. After ten minutes, each group will come up to present their written summaries to the class. The presentations should only take five minutes a piece. Follow-up questions may be asked by the instructor or other students in the class to clarify information given by the group. The instructor will fill out a rubric for each group for the presentation of the summaries, attached at the end of this lesson plan.</p>
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Summary and Review:

Take five minutes at the end of the first class period for this lesson, have students take out a piece of paper and write their names at the top. They will take a quiz related to the interest approach activity done at the beginning of class. Questions include:

1. What are the three R’s?
2. T/F – PETA is an animal welfare organization.
3. List at least three of the five freedoms.

Take ten minutes at the end of the second class period after all groups have presented for this lesson and pose these questions to students to write down and discuss as a class:

1. What is one thing you learned or were surprised about regarding research animal legislation?
2. What is one thing you would change about current research animal legislation in the United States, if anything, and why? **(Each student needs to answer this question.)**

The purpose of this kind of review is to allow students to reflect on what they have learned and think critically about the information that was presented to them, challenging them to determine if they believe current legislation is doing enough to protect research animals or if changes need to be made. All students should be encouraged to participate in the discussion. If it is a large class, then divide students into groups to discuss and present their findings to the rest of the class at the end.

Applications:

Students are able to apply what they have learned from the material presented in writing about something that they found interesting in learning about current research animal legislation and taking what they have learned to think critically about that legislation. Students utilize their new knowledge to have a discussion with the class as to whether or not current legislation is enough or if more needs to be added. Students also build their team-building and communication skills by working with their peers to create a short summary of the subpart they were assigned to research and present to the class.

Evaluation:

Teachers may evaluate students based on their ability to not only respond to the discussion questions but also their ability to defend their answers. A rubric is provided for the summary presentation portion of the class period.

Animal Welfare Act Group Project

Instructions: You have learned the basic concepts behind animal welfare. Now, you will work together with your group members to develop a summary on specific subparts of the “USDA Animal Care Animal Welfare Act and Animal Welfare Regulations” guide. Each group is assigned a subpart. Your written summary should be done as follows:

Writing Parameters:

- Header including group members, class, date, and name of project (listed at top of this page)
- Typed, 12 point Times New Roman font
- 1.5” spacing
- Two paragraphs, one about the specifications and the second about how those specifications meet (or do not meet) the five freedoms discussed in class. The requirements for the paragraphs are described below.

Paragraph One:

- Minimum of five sentences
- General overview of facilities (indoor and outdoor)
- General overview of feeding and watering, and feed and water requirements
- General overview of sanitation procedures
- Proper handling procedures

Paragraph Two:

- Minimum of five sentences
- Reflection on the written general overviews. Relate what you learned from your assigned Subpart and determine if the specifications put in place meet the criteria set by the five freedoms as discussed in class. If they do or do not, explain why they do or do not.
- Recommendations that your group has for new legislation that should be implemented to better enhance animal welfare for research animals.

A printed copy of your group’s summary will need to be turned into the teacher before you present. You will have five minutes to present your summary. Each group member will need to contribute to the oral presentation.

Instructor Rubric for Animal Welfare Act Group Project

Group Members:

(Presentation portion italicized, written portion in bold.)

<u>Criteria</u>	<u>Points</u>
<i>Each member of the group participated in the presentation.</i>	_____/5
<i>Introduced what subpart covered</i>	_____/1
<i>Facilities discussed</i>	_____/1
<i>Feed and water discussed</i>	_____/1
<i>Sanitation discussed</i>	_____/1
<i>Handling procedures discussed</i>	_____/1
<i>Discussed how specifications relate to the five freedoms</i>	_____/2
Minimum of five sentences for both paragraphs	_____/2
Proper grammar and spelling	_____/1
TOTAL POINTS:	_____/15

CHAPTER 5. REFLECTION

Overall, this creative component was challenging but also invigorating and eye-opening task to complete. It was an important project to me thanks in part to my personal experiences working in an animal research facility as an animal caretaker. I had not stepped foot in a research facility before that point, and through this work I was able to come to appreciate all the time, work, effort, and care put forth in ensuring that research animals are well taken care of. Additionally, while working at the research facility, Iowa State had implemented a laboratory animal class for students in the animal science program. Due to schedule constraints I was not able to take the course myself but through friends taking the course and also acting as teaching assistants for it, I realized how little we are taught about research animals in both high school and college. This was especially surprising considering how much of an impact research animal have had on today's society, and how much of an impact they continue to have.

I created these lesson plans in order to help bridge that gap in a way high school students could understand the current legislation, how it got to be where it is today, looking at species-specific specifications for housing and the like, and then finally taking what they have learned and culminating it into creating their own piece of legislation that they believe would be beneficial to research animals. Originally, there were three lesson plans. However, after developing the first two it became apparent to me the third one I was developing was perhaps at too high of a level for introductory animal science students to be able to learn properly without more scaffolding and other lessons put in place. As such, I decided to scratch the third lesson plan. When I did that, I lost the last part of Bloom's taxonomy that I was trying to implement. To supplement this missing piece, I put it in the second lesson plan, as the part where after

students have made their presentations, they have time to reflect on what they have learned and then create legislation they would like to see in the animal research world.

The other challenge that I encountered while developing these lesson plans was that of time. I had a very heavy course load my second semester in my graduate program and working on my creative component was not always at the forefront of my mind. I also prefer to have everything done as much as I can and am not happy until a near final product is ready to be presented. Reflecting back on these challenges has made me think of ways that I would do things differently should I be given the option to start over. One such way would be to not take such a heavy course load in graduate school in order to open up more time to work more diligently on my creative component. In addition, utilize my committee members more in sending out rough drafts throughout the process of writing the lesson plans. In doing these things I believe that would have streamlined the process more and taken off some of the stress of working on the creative component.

The educational concepts and theories that I have been able to learn about and put into practice throughout my graduate career have been hugely beneficial in helping me grow and develop as an educator. The educational psychology class that I took allowed me to learn more in-depth on how to better motivate students in learning. My methods of teaching agriculture class gave me the opportunity to put some of those motivational factors and learning theories into practice in doing the micro-teaching assignments throughout the semester. The seminars that I participated allowed me to better enhance my writing skills. These are just a few examples of the greater impact that the Agricultural Education Master's program at Iowa State University had on me in my short time as a graduate student.

Despite the challenges, I am proud of what I was able to create for this creative component. I wanted to make something that I would be able to use in my own future classroom and believe that I have been able to do that. As time goes on and legislation changes, the lesson plans will need to be tweaked and changed to stay up-to-date. I hope in the future I can continue building on these lesson plans and developing more of them related to research animals to have a larger and more well-rounded research animal unit for an animal science class.

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