NORTH GEORGIA
TECHNICAL COLLEGE

Modern Diversified Agriculture Program

Livestock and Poultry Production and Management Curriculum

(to be used together with
Modern Livestock & Poultry Production,
9th Edition (Flanders, Gillespie) as lab manual)

Wayne Randall

Table of Contents

Unit 1: Animal Agriculture as Science

Lesson 1: Scientific Discoveries in Animal Agriculture

Objectives:

1. Cite scientific discoveries in animal agriculture.
2. Evaluate the developments that have revolutionized animal agriculture.
3. List the pharmaceuticals that are derived from animals.

Teaching Time: 3 hours

Essential Question:

What are some of the important scientific discoveries in animal agriculture?

Unit Understandings, Themes, and Concepts:

Students will understand how genetic engineering in agriculture affects their daily lives and how progress in agricultural biotechnology can further society.

Primary Learning Goals:

In this unit students will be able to cite scientific discoveries in animal agriculture. Students will also be able to evaluate the developments that have revolutionized animal agriculture and list the pharmaceuticals that are derived from animals.

Students with disabilities:

For students with disabilities, the instructor should refer to the individual student's 504 to ensure that the accommodations specified in the 504 are being provided within the classroom setting.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Gillespie, James R. *Modern Livestock and Poultry Production.*

Herren, Ray V. *The Science of Animal Agriculture.*

Osborne, Edward W. *Biological Science Applications in Agriculture.*

Materials and Equipment:

Computer

Internet access

PowerPoint™:

Academic Standards:

1. Students will determine strategies for finding content and contextual meaning for unfamiliar words or concepts.
2. Students will identify and investigate problems scientifically.
3. Students will communicate scientific investigations and information clearly.

4. Students analyze how scientific knowledge is developed.
5. Students will understand important features of the process of scientific inquiry.
6. Students will enhance reading in all curriculum areas.
7. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

TEACHING PROCEDURE

Introduction and Mental Set

Can you name a scientific discovery in agriculture? (Cloning an animal - i.e., Dolly.) List all responses on the board.

Discussion

1. **Review the scientific discoveries in animal agriculture identified by the students.**
   The students could also write a short essay about one page describing a scientific discovery in animal agriculture.

2. **List the following vocabulary words on the whiteboard:**
   For their homework, have the students define the words. They can use any source: Internet, dictionary, or their textbooks. Ask the students to define the words pertaining to animal agriculture.
   a. Gender selection
   b. Genotyping
   c. Bovine somatotropin
   d. Embryo transfer
   e. Gene mapping
   f. DNA
   g. Superovulation
   h. Transgenic organism
   i. Genetic engineering
   j. Pseudorabies vaccine.

3. **Define, discuss, and evaluate how each of these areas have revolutionized animal agriculture**.
   Do this after students have submitted their completed homework.

4. **Ask students to use the Internet to search for pharmaceuticals derived from animals**.
   a. Have each student print out a different product and share each with the class.
   b. After the presentation, ask the students to name some of pharmaceuticals that were presented and prepare a list on the board with some of its important benefits.

5. **Have students read the chapter about biotechnology**.
   The students should be able to discuss several current events in genetic engineering that have the potential to have a major impact on the livestock industry.

SUMMARY

Progressive scientific research began in this country about the middle of the 1800's. The nation was emerging as an industrial and agricultural-based economy. To make progress in these areas, young people needed to be taught how to produce food and manufactured goods in a more efficient manner. As our population has continued to increase, this need has become more and more important.

Evaluation

Written test

Individual Learning Activity

Lesson: Scientific Discoveries in Animal Agriculture

1. Cite scientific discoveries in animal agriculture.
2. Evaluate the developments that have revolutionized animal agriculture.
3. List the pharmaceuticals that are derived from animals.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Scientific Discoveries in Animal Agriculture

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Cite scientific discoveries in animal agriculture.
2. Evaluate the developments that have revolutionized animal agriculture.
3. List the pharmaceuticals that are derived from animals.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Scientific Discoveries in Animal Agriculture

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Cite scientific discoveries in animal agriculture.
2. Evaluate the developments that have revolutionized animal agriculture.
3. List the pharmaceuticals that are derived from animals.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a 2-5-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics- spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Essential Question:

What are some of the important scientific discoveries in animal agriculture?

Vocabulary

Gender selection
Genotyping
Embryo
Transfer
Superovulation
Genetic engineering

Unit 1: Animal Agriculture as Science

Lesson 2: Careers in Animal Science

Objectives:

1. Discuss career opportunities in animal science.
2. Report on selected animal science technology/ biotechnology careers.

Teaching Time: 2 hours

Essential Question:

What types of careers are available in animal science?

Unit Understandings, Themes, and Concepts:

Students will learn about the various careers in agriculture and how agriculture encompasses a wide variety of careers and job opportunities.

Primary Learning Goals:

Students will be able to identify and explain various careers available in animal science, as well as the educational requirements necessary to obtain these careers.

Students with disabilities:

For students with disabilities, the instructor should refer to the individual student's 504 to ensure that the accommodations specified in the 504 are being provided within the classroom setting.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Gillespie, James R. *Modern Livestock and Poultry Production.*

Herren, Ray V. *The Science of Animal Agriculture.*

Instructional Material Services. University of Missouri-Columbia. Plant Science.

Materials and Equipment:

White Board

Projector/ SMART Board®

Performance Standards:

The student:

1. Demonstrates the application of scientific methods in agricultural animal research and production.
2. Investigates and reports on selected animal science technology/biotechnology careers.

Academic Standards:

1. Students will determine strategies for finding content and contextual meaning for unfamiliar words or concepts
2. Students will identify and investigate problems scientifically.
3. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.
4. Students will communicate scientific investigations and information clearly.
5. Students will understand important features of the process of scientific inquiry

TEACHING PROCEDURE

Introduction and Mental Set

Show the video series *Career in Agriculture* or take the students to the library and assign them an agricultural career. Each student should research the career and present the information to the class orally. This will increase student self-concept. Grade the students on written and oral presentation.

Discussion

1. **What are career opportunities which require knowledge of animal science?** Possible student responses:
   a. marine biologist
   b. zookeeper
   c. veterinarians
   d. cattle producer
   e. hog producer
   f. horse producer
   g. sheep producer
   h. agriculture teacher
   i. farmer

2. **Lead into employment opportunities for college graduates in the food and agricultural sciences.**
   Explain the percentages of each of the nine areas of employment.

3. **What is the career decision making process?**
   Have students determine what type of job might be suitable for them.
   a. Explain to students the importance of making goals and working toward them.
   b. Explain that now is the time to make decisions that can affect the rest of their life. College, career, etc.

4. How can we determine a person's capacity to perform?

Areas of self-analysis that help us better understand our capabilities:

a. talent
b. physical make-up
c. previous experience
d. interests
e. educational aspirations
f. attitudes and values
g. self-concept
h. flexibility
i. personality

5. Define biotechnology and animal technology

a. Biotechnology: The management of biological systems for the benefit of humans
b. Animal Technology: The practical use of animal science
c. Discuss careers that are directly related to biotechnology and animal technology. List each on the whiteboard.

SUMMARY

Summarize the lesson with a discussion about the many careers in agriculture. Show the transparencies of application of agriculture careers under the broad areas such as science, engineering, life sciences, and education just to mention a few.

Evaluation

Written test
Written and oral reports

Employment Opportunities in Food and Agriculture Science	
Career Category	**Percentage of Agriculture Workers in Career Category**
Marketing and Sales	32%
Scientists and Engineers	29%
Manager and Financial Specialists	14%
Social Services	11%
Agriculture Production	8%
Education and Communication	6%

7 Steps in the Career-Making Process

Step 1: Identify the problem.

Step 2: Gather information:
a. People
b. Places
c. Things

Step 3: Weigh the evidence:
a. Advantages: What is good? Then, yes.
b. Disadvantages: What is bad? Then, no.

Step 4: Identify alternatives:
a. Alternative 1
b. Alternative 2
c. Alternative 3

Step 5: If necessary, select one of the identified alternatives.

Step 6: Organize and make other related choices before finalizing decision:
a. Dates and times
b. Things to do
c. People to meet
d. Places to visit

Step 7: Evaluate decision.
After a while, if the decision turns out not to be suitable, start again with Step 3.

Basic Concepts Related to Career Decision-Making

- Career decision-making is continuous.
- Career decisions involve compromises.
- Actions take precedence over certainty.
- Time is an ally.
- Flexibility to change is a plus.
- Happiness is independent of success.
- Most people are multi-potentiate. In other words, they excel or have interests in more than one field.

Individual Learning Activity

Lesson: Careers in Animal Science

Assignment:

Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Discuss career opportunities in animal science.
2. Report on selected animal science technology/ biotechnology careers.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

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Group Learning Activity

Lesson: Careers in Animal Science

Assignment:

Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Discuss career opportunities in animal science.
2. Report on selected animal science technology/biotechnology careers.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

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Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Careers in Animal Science

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Discuss career opportunities in animal science.
2. Report on selected animal science technology/ biotechnology careers.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a 2-5-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
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Mechanics- spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. Name three career opportunities that require knowledge of animal science.

2. Name three areas of self-analysis that may help one choose a career goal.

3. Define biotechnology.

4. Define animal technology.

Lesson Evaluation Key

1. Any three of the following: marine biologist; zookeeper; veterinarians; cattle producer; hog producer; horse producer; sheep producer; Ag teacher; farmer

2. Any three of the following: talent; physical make-up; previous experience; interests; educational aspirations; attitudes and values; self-concept; flexibility; personality

3. Biotechnology: The management of biological systems for the benefit of humans

4. Animal Technology: The practical use of animal science.

Teacher's Notes

Essential Question:

What types of careers are available in animal science?

Vocabulary

Animal science
Animal technology
Biotechnology

Unit 2: Large Animal Science

Lesson 1: Meat Consumption

Objectives:

1. Develop a chart of the per capita consumption of products from large animals grown in the United States.
2. Justify the use of agricultural land to produce meat animals.

Teaching Time: 2 hours

Essential Question:

Why is meat produced?

Unit Understandings, Themes, and Concepts:

In this unit, students will be able to develop a chart of the per-capita consumption of the products from large animals grown in the United States. The student will also be able to justify the use of agricultural land to produce meat animals.

Primary Learning Goals:

Students will identify products obtained by large animals and learn how large animal production affects their daily lives. Students will also observe trends in meat production and consumption in the United States as compared with the rest of the world.

Students with disabilities:

For students with disabilities, the instructor should refer to the individual student's 504 to ensure that the accommodations specified in the 504 are being provided within the classroom setting.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Flanders, Frank & Ray Herren. The Science of Animal Agriculture Lab Manual. Delmar Publishers, Inc. Albany, NY.

Materials and Equipment:

LCD projector
PowerPoint™

TEACHING PROCEDURE

Introduction and Mental Set

Ask students to make a list of all the products they use in a day that come from large animals.

Discussion

1. What products do we get from large animals?

a. Beef
b. Veal
c. Pork
d. Lamb and mutton
e. Chicken
f. Turkey
g. Milk products

2. Why is it important to use agricultural land to produce animals?

a. Produce forage
b. Produce grain

3. Explain to students how animals must have agricultural lands to survive, whether it is on pastureland or eating high concentrations of grain in a feedlot.

4. Define:

a. Forage
b. Hay
c. Silage
d. Ration

SUMMARY

1. How has per capita meat consumption changed in the last twenty years?

2. Which large animal gives us the most agricultural products?

3. Has your family's meat consumption increased or decreased over the years? Why?

4. Talk about healthy lifestyle movements in the U.S.

5. Explain to students that the survival of the large animal industry depends on the use of agricultural lands to produce not only the animals but also all the things those animals eat.

Evaluation

Lab activity
Written test

Individual Learning Activity

Lesson: Meat Consumption

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Develop a chart of the per capita consumption of products from large animals grown in the United States.
2. Justify the use of agricultural land to produce meat animals.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Meat consumption

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Develop a chart of the per capita consumption of products from large animals grown in the United States.
2. Justify the use of agricultural land to produce meat animals.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Meat Consumption

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Develop a chart of the per capita consumption of products from large animals grown in the United States.
2. Justify the use of agricultural land to produce meat animals.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a 2-5-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics- spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. Give three examples of products we get from large animals.

2. Why is it important to use agricultural land to produce animals?

Lesson Evaluation Key

1. Any three of the following: beef; veal; pork; lamb and mutton; chicken; turkey; milk products

2. Produce forage; produce grain

Essential Question:

Why is meat produced?

Vocabulary

Beef
Veal
Pork
Forage
Silage
Ration

Teacher's Notes

Unit 2: Large Animal Science

Lesson 2: Binomial Nomenclature

Objectives:

1. Explain how agricultural animals are classified scientifically.
2. Explain the use of the binomial system of classification.
3. Use the five kingdoms to classify all living organisms.
4. Explain the different categories used in the scientific classification of animals.
5. Identify characteristics of animals that place them in different classifications.

Teaching Time: 2 hours

Unit Understandings, Themes, and Concepts:

In this unit, students will explain how agricultural animals are classified scientifically. They also will explain the use of the binomial system of classification and use the five kingdoms to classify all living organisms. They also will explain the different categories used in the scientific classification of animals and identify characteristics of animals that place them in different classifications.

Primary Learning Goals:

Students will explain how the binomial nomenclature is used as well as the purposes of its use as it relates to agriculture.

Students with disabilities:

For students with disabilities, the instructor should refer to the individual student's 504 to ensure that the accommodations specified in the 504 are being provided within the classroom setting.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	__x__ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Herren, Ray V. *The Science of Agriculture: A Biological Approach.* Delmar Publishers, Inc. Albany, NY.

Materials and Equipment:

White Board
Projector/SMART Board®

PowerPoint™:

The student classifies animals using scientific binomial nomenclature as well as classifies agriculture animals by breed and use.

a. Explains how agricultural animals are classified scientifically.
b. Explains the use of the binomial system of classification.
c. Utilizes kingdoms to classify all living organisms.
d. Identifies characteristics of animals that place them in different classifications.

Academic Standard:

1. Students will identify messages and themes from books in all subject areas.

2. Students will enhance reading in all curriculum areas.

3. Students will:
   a. Relate the complexity and organization of organisms to their ability for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain the organism.
   b. Examine the evolutionary basis of modern classification systems (six kingdoms).

4. Students will evaluate the role of natural selection in the development of the theory of evolution.

TEACHING PROCEDURE

Introduction and Mental Set

Ask students what a gopher is. Most will say a gopher is a large rat. Explain to them that in Maryland a gopher is considered a terrapin while in Oregon it is considered an animal that burrows in the ground. Explain that the binomial system was developed to prevent misunderstandings.

Discussion

1. How are agricultural animals classified?

a. Breed
b. How they are used
c. Physical appearance

2. What is the binomial nomenclature system of classification?

a. A system developed by Swedish botanist Carolus Linnaeus that grouped organisms by similar characteristics.
b. Uses a 2-part Latin name.

3. Why is the scientific classification of animals essential in studying and communicating about them?

a. To be sure the animals in question are specific animals
b. No two animals in the world have the same scientific name.

4. Common names are often given to different animals in different areas and can be misleading.

5. What are the 5 kingdoms?

a. Animalia - all multi-celled animals
b. Plantae - multi-celled plants that produce chlorophyll
c. Monera - bacteria and blue-green algae
d. Protista - paramecia and amoebae
e. Fungi - mushrooms and other fungi

6. What are the categories used in classifying animals?

a. Kingdom
b. Phyla
c. Class
d. Order
e. Family
f. Genus
g. Species

7. What are some of the characteristics of animals that place them in different classifications?

a. Backbones – vertebrae
b. Give milk – Mammalia
c. Ruminants - Ruminantia.

8. Choose an animal and classify it using your textbook as a class discussion. Write the results on the board.

SUMMARY

There are millions of different types of living things in the world. Scientific classification allows us to identify each one and be able to communicate around the world about the same animal with some accuracy. Without scientific classification, a black bird in the U.S. may be one bird and a black bird in China may be a totally different bird.

Evaluation

Written test

Individual Learning Activity

Lesson: Binomial Nomenclature

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Explain how agricultural animals are classified scientifically.
2. Explain the use of the binomial system of classification.
3. Use the five kingdoms to classify all living organisms.
4. Explain the different categories used in the scientific classification of animals.
5. Identify characteristics of animals that place them in different classifications.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:
Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Binomial Nomenclature

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Explain how agricultural animals are classified scientifically.
2. Explain the use of the binomial system of classification.
3. Use the five kingdoms to classify all living organisms.
4. Explain the different categories used in the scientific classification of animals.
5. Identify characteristics of animals that place them in different classifications.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be submitted to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. It can be written or oral but should show the instructor that the class understands and has retained the material taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Binomial Nomenclature

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Explain how agricultural animals are classified scientifically.
2. Explain the use of the binomial system of classification.
3. Use the five kingdoms to classify all living organisms.
4. Explain the different categories used in the scientific classification of animals.
5. Identify characteristics of animals that place them in different classifications.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. How are agricultural animals classified?

2. What is the binomial nomenclature system of classification?

3. Why is the scientific classification of animals essential to studying and communicating about them?

4. What are the five kingdoms?

5. What are the categories used in classifying animals?

6. What are some of the characteristics of animals that place them in different classifications?

Lesson Evaluation Key

1. Breed; how they are used; physical appearance

2. A system developed by Swedish botanist Carolus Linnaeus that grouped organisms by similar characteristics. It uses a two-part Latin name.

3. To be sure the animals in question are specific animals. No two animals in the world have the same scientific name.

    a. Animalia: all multi-celled animals
    b. Plantae: multi-celled plants that produce chlorophyll
    c. Monera: bacteria and blue-green algae
    d. Protista: paramecia and amoebae
    e. Fungi: mushrooms and other fungi

4. Kingdom; Phyla; Class; Order; Family; Genus; Species

5. Animal characteristics
    a. Backbones: vertebrae
    b. Give milk: mammalia
    c. Ruminants: ruminatia

Essential Question:

What is binomial nomenclature?

Vocabulary

Binomial nomenclature system
Animalia
Plantae
Monera
Fungi
Protista

Unit 2: Large Animal Science

Lesson 3: Livestock Production

When learning about different types of livestock, it is important to have basic knowledge on how to raise them. During these vivid presentations, the students will develop a basic understanding of the different classifications of livestock.

Keywords:

Parturition
Finish
MR
AGD
Mohair
Chevon
Fleece
Flock
Mutton
Prolificacy
PSE
Needle teeth
Feeder pig

Livestock Production:

The student determines nutritional requirements of ruminant and non-ruminant animals, including poultry.

Principles of Agriculture, Food and Natural Resources

The student develops technical knowledge and skills related to animal systems. The student is expected to:

1. Describe animal growth and development
2. Identify breeds and classes of livestock; and
3. Discuss animal selection

Learning Objectives:

The learner will:

- Classify livestock animals by their breed and classes
- Understand feeding practices and nutrition for different livestock
- Understand different animal behaviors
- Understand different types of diseases for different livestock species
- Understand basic care for various livestock species
- Be able to measure and discuss animal growth and development
- Be able to evaluate livestock to select the best species

Time Required:

1. Five, 50-minute class periods to present the PowerPoint™
2. Five, 20-to-30-minute class periods to perform the activities

Reusable Activity Cost Per Group [in dollars]: $5

Materials:

- PowerPoint™ presentations about cattle, equine, goats, sheep, swine
- Branding activity packet
- Equine crossword
- Goat and sheep Jeopardy PowerPoint™ games
- Construction paper
- Scissors or ear notching tool
- Jar with pig and litter numbers
- Swine ear notching packet

Background and Concepts for Instructors:

- Breeds of livestock
- Management practices
- Livestock facilities
- Feeding practices
- Animal behavior
- Animal growth
- Animal health
- Evaluation of livestock

Lesson Introduction/Motivation:

It is very important for students to have a basic knowledge of livestock animals. Have the students brainstorm or call out what they already know about the different species of livestock.

Presentation/Explanation:

PowerPoint™: Five presentations that detail different aspects that students need to know about raising and understanding the five basic livestock species.

Activity/Application:

1. **Branding Activity:** This activity enables students to learn about the history and importance of branding and making their own brand. The students will follow the directions that are provided in the branding activity packet and answer the follow-up questions to assess their comprehension and knowledge of the topic.

2. **Equine Crossword**: This activity allows students to apply the knowledge that they learned in the Equine PowerPoint™ presentation. This crossword focuses on major topics from the lecture and requires the students to recall the terminology in order to fill out the crossword puzzle.

3. **Goat Jeopardy:** This activity is a fun and interactive way for the students to assess their knowledge of goats. This is played just like the regular Jeopardy game. The students can be divided up into teams, and the winner can get a prize.

4. **Sheep Jeopardy**: his activity is a fun and interactive way for the students to assess their knowledge of sheep. This is played just like the regular Jeopardy game. The students can be divided up into teams and the winner can get a prize.

5. **Swine Ear Notching:** In this hands-on activity, the students will construct their own pig heads. They will draw pig and litter numbers at random from a jar and ear notch their pigs. After everyone is done, the students can present their pigs so that the class can guess the litter number and pig number for their pig.

Lesson Closure:

The instructor will lead a discussion to assess what students have learned about the different animals. Below are examples of questions to engage students in the discussion. Students can also lead the discussion based on
the questions they created.

1. Name behaviors common to each animal species.
2. Discuss breeds you found particularly interesting.
3. Discuss some of the management practices which should be followed for the different species.
4. Why is it important to evaluate livestock?
5. List the different contests that utilize the evaluation of livestock.

Assessment/Evaluation:

Examples of questions to check for comprehension:

1. **Cattle:**
    - What are two major categories of cattle?
    - Name 3 dairy breeds and 5 beef breeds of cattle.
    - Explain the different methods of identification.
    - How many pounds of hay should a cow have a day?
    - Explain a type of behavior most cattle have.
    - How do we measure cattle growth?
    - What are the terms used to describe diseases?
    - What body parts of cattle are most important to evaluate?

2. Equine:

- What categories are horse breeds separated into?
- Name five horse breeds.
- What are chestnuts?
- List the five white patterns on the face of a horse?
- List the five ways to describe white patches on a horse's leg or foot.
- Name types of horse behavior which are signs of aggression?
- What unit of measurement is used for horses?
- How is a horse's age determined?
- What body parts of horses are evaluated for muscle?

3. Goats:

- Name two breeds of goats.
- What do Angora goats produce?
- What is the purpose of exercise for goats?
- Why should goats, especially show goats, be fed on an incline?
- What is sneezing?
- What is meant by the phrase "seasonal breeders"?
- What body parts of goats are evaluated for muscle?

4. Sheep:

- How are sheep breeds separated?
- Name one breed from each classification.
- What animals are good predator controls for sheep?
- What mineral do you have to be cautious when feeding sheep?
- Name one natural and one learned behavior of sheep?

- What is the feed conversion for sheep?
- Explain Enterotoxaemia.
- What body parts of sheep are evaluated for fat cover?

5. Swine:

- Name 5 swine breeds.
- What is the most common identification system for swine?
- What ear does the litter number go in?
- What ear does the pig number go in?
- What accounts for most of the production expenses of swine?
- What is a natural behavior for pigs?
- What is the gestation length of pigs?
- What is Porcine Stress Syndrome (PSS)?
- What body parts of swine are evaluated for muscle?

Unit 2: Large Animal Science

Lesson 4: Management Practices Used in Animal Production

Objectives:

1. Debate management practices used in the production of agricultural animals.
2. Investigate the benefit to producers of content and healthy animals.
3. Explain potential problems related to the continuous ingestion of antibiotics.

Teaching Time: 1 hour

Essential Question:

What management practices are used to produce agricultural animals?

Unit Understandings, Themes, and Concepts:

Students will learn about the management practices used to produce agricultural animals as well as the reasons that producers implement these practices. Additionally, students will learn about the drawbacks of excessive antibiotic use.

Primary Learning Goals:

In this unit, students will debate management practices used in the production of agricultural animals. The students will also investigate the benefit to producers of content and healthy animals and explain potential problems related to the continuous ingestion of antibiotics.

Assessment Method/Type:

_____ Constructed Response	__x__ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Flanders, Frank & Ray Herren. *The Science of Animal Agriculture Lab Manual*. Delmar Publishers, Inc. Albany, NY.

Materials and Equipment:

SMART Board®

Performance Standard:

The student describes crucial animal welfare issues and explains the benefits of treating animals in a humane manner and providing for the animals' needs.

1. Debates management practices used in the production of agricultural animals.
2. Investigates the benefit to producers of content and healthy animals.
3. Explains potential problems of animal production such as the continuous use of antibiotics.

Academic Standards:

1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

2. Students will identify and investigate problems scientifically.

3. Students will communicate scientific investigations and information clearly.

4. Students will enhance reading in all curriculum areas.

5. Students will offer their own opinion assertively but without being domineering, including:
    a. Contributing voluntarily and responding directly when solicited by teacher or discussion leader.
    b. Giving reasons to support opinions expressed.

6. Students will employ group decision-making techniques such as brainstorming or a problem-solving sequence. Example of problem-solving sequence:
    a. Recognizes problem
    b. Defines problem
    c. Identifies possible solutions
    d. Selects optimal solution
    e. Implements solution
    f. Evaluates solution

TEACHING PROCEDURE

Introduction and Mental Set

1. Ask students to defend their position on the following issue: Do you approve or disapprove of drugs being used on animals for human consumption?

2. Discuss how humans take prescription drugs to better their lives and vitamins to improve growth.

3. Drugs save animals from diseases and parasites. Discuss the withdrawal period before slaughtering animals.

Discussion

1. **Discuss management practices that animal rights and animal welfare activist disagree with:**
   a. Feeding antibiotics as a preventive
   b. Dehorning
   c. Debeaking
   d. Castration
   e. Tail docking

2. **Why must producers implement these productive practices?**
   a. For the health of the animal
   b. Prevent animal injury

3. **What are new or alternative procedures livestock producers have implemented to avoid criticism from these groups?**
   a. Elastrator bands
   b. Freeze branding
   c. Observing withdrawal symptoms from all medications, antibiotics, wormers, etc.

4. **Have students list management practices that might be criticized.** Students should then make a list of alternative practices that might be more readily accepted.

5. **Divide the students into groups of three to debate the advantages and disadvantages of popular animal management practices.**

SUMMARY

Most management practices are necessary for the efficient production of livestock. It is important to remember that all these practices are done with the health and best interests of the animal in mind.

Evaluation

- **Written Test**
- **Debate presentation**

Individual Learning Activity

Lesson: Management Practices Used in Animal Production

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Debate management practices used in the production of agricultural animals.
2. Investigate the benefit to producers of content and healthy animals.
3. Explain potential problems related to the continuous ingestion of antibiotics.

Minimum Requirements:

5. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

6. **At least two credible references must be properly cited.**

7. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

8. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Management Practices Used in Animal Production

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Debate management practices used in the production of agricultural animals.
2. Investigate the benefit to producers of content and healthy animals.
3. Explain potential problems related to the continuous ingestion of antibiotics.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be submitted to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. It can be written or oral but should show the instructor that the class understands and has retained the material taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Management Practices Used in Animal Production

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Debate management practices used in the production of agricultural animals.
2. Investigate the benefit to producers of content and healthy animals.
3. Explain potential problems related to the continuous ingestion of antibiotics.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

What are management practices that animal rights activists disagree with?

1)

2)

3)

Why must producers implement these practices?

4)

5)

6)

What are new, alternative practices that have emerged after criticism from these groups?

7)

8)

9) What is a withdrawal time?

10) Why is it important for producers to follow withdrawal times?

Lesson Evaluation Key

1. – 3.) Tail docking, branding, ear notching, castration, dehorning, debeaking, feeding antibiotics as a preventative

4. – 5.) Keep animals safe, improve sanitation, protect mother animals (needle teeth clipping), identification, improve efficiency, etc.

7. – 8.) Elastrator bands, freeze branding, observing/following all labels and directions on medication

9.) The amount of time it takes for a substance to leave an animal's body

10.) Keeps end-product safe for consumers

Teacher's Notes

Essential Question:

What management practices are used to produce agricultural animals?

Vocabulary

Dehorning
Debeaking
Tail docking
Castration

Unit 3: Reproductive Process of Agricultural Animals

Lesson 1: Sexual and Reproductive Behavior of Agricultural Animals

Objectives:

1. Analyze the sexual and reproductive behaviors in agricultural animals.
2. Describe the types of sexual and reproductive behaviors in agricultural animals.
3. Observe animal behavior and successfully collect data for an ethogram.
4. Interpret ethogram data and make implications.

Teaching Time: 2 Hours

Essential Question:

What types of sexual and reproductive behavior do agricultural animals exhibit?

Unit Understandings, Themes, and Concepts:

In this unit, students will:

1. Analyze the sexual and reproductive behaviors in agricultural animals.
2. Describe the types of sexual and reproductive behaviors in agricultural animals.
3. Observe animal behavior and successfully collect data for an ethogram and interpret ethogram data and make implications.

Primary Learning Goals:

Students will explain how natural stimuli affect animal production.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Herren, Ray. *The Science of Animal Agriculture.* Delmar Publishers, Inc. Albany, NY.

Herren, Ray. *The Science of Animal Agriculture Lab Manual.* Delmar Publishers, Inc. Albany, NY.

Equipment:

See Lab Manual.

Performance Standards:

The student:

1. Observes and interprets the natural behavior of agricultural animals and relates these behaviors to production practices that yield more content, healthier, and productive animals.
2. Analyzes the types of sexual and reproductive behaviors in agricultural animals.
3. Observes animal behavior and successfully collects data for an ethogram.

Academic Standards:

1. Students will evaluate the role of natural selection in the development of the theory of evolution.

2. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

TEACHING PROCEDURE

Introduction and Mental Set

Ask if any of the students has ever noticed an animal exhibit sexual behavior? Bull or ram raise upper lip, dogs smell each other.

Discussion

1. **What behaviors do most farm animals exhibit during estrus?**
   a. Mount or ride other animals.
   b. Males become more aggressive toward other animals and humans

2. **After an animal's offspring is born, how does the mothers behavior change?**
   a. She almost always becomes more aggressive and protective of her young.
   b. This is nature's way of protecting the young from predators.
      - A sow will accept an orphan pig if she has an open teat
      - Cows and sheep do not accept orphans readily.

3. **Lead students through lab exercise 10.3 in lab manual.**

SUMMARY

Most sexual and reproductive behavior exhibited in animals is instinctive. Can you identify a behavior that might have been learned?

Evaluation

Lab activity
Written test

Individual Learning Activity

Lesson: Sexual and Reproductive Behavior of Agricultural Animals

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Analyze the sexual and reproductive behaviors in agricultural animals.
2. Describe the types of sexual and reproductive behaviors in agricultural animals.
3. Observe animal behavior and successfully collect data for an ethogram.
4. Interpret ethogram data and make implications.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**
2. **At least two credible references must be properly cited.**
3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**
4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:
Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Sexual and Reproductive Behavior of Agricultural Animals

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Analyze the sexual and reproductive behaviors in agricultural animals.
2. Describe the types of sexual and reproductive behaviors in agricultural animals.
3. Observe animal behavior and successfully collect data for an ethogram.
4. Interpret ethogram data and make implications.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Sexual and Reproductive Behavior of Agricultural Animals

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it's relevant to your life.

1. Analyze the sexual and reproductive behaviors in agricultural animals.
2. Describe the types of sexual and reproductive behaviors in agricultural animals.
3. Observe animal behavior and successfully collect data for an ethogram.
4. Interpret ethogram data and make implications.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last a minimum of five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

What behaviors do most farm animals exhibit during estrus?

1)

2)

How does an animal's behavior change after she gives birth?

3)

4) Which species is willing to accept an orphan more readily?

Lesson Evaluation Key

1. Mount or ride other animals
2. Becomes more aggressive
3. Becomes more aggressive to protect her offspring
4. Pigs

Teacher's Notes

Essential Question:

What types of sexual and reproductive behavior do agricultural animals exhibit?

Vocabulary

Estrus
Offspring

Unit 3: Reproductive Process of Agricultural Animals

Lesson 2: Reproductive Systems of the Male and Female

Objectives:

1. Describe the parts and functions of the male reproductive system.
2. Describe the parts and functions of the female reproductive system.
3. Analyze the functions of the hormones that control reproduction.
4. Describe the phases of the female reproductive cycle.

Teaching Time: 2 hours

Essential Question:

How do the male and female reproductive systems function?

Unit Understandings, Themes, and Concepts:

Students will gain an understanding of how market research and surveys help produces meet demands for agricultural products and services.

Primary Learning Goals:

Students will explain reproduction and how reproduction is vital to life processes of animals.

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__x__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Herren, Ray. *The Science of Animal Agriculture.* 2nd Edition. Delmar Publishers, Inc. Albany, NY.

YouTube™ *Animal Reproduction*

Materials and Equipment:

Computer

LCD projector

Performance Standards:

The student demonstrates an understanding of the reproductive anatomy and biological processes involved in the reproduction of agricultural animals.

1. Describes the parts and functions of the male and female reproductive system.
2. Analyzes the functions of the hormones that control reproduction.
3. Describes the phases of the female reproductive cycle.

Academic Standards:

1. Students will enhance reading in all curriculum areas.

2. Students will analyze how biological traits are passed on to successive generations.

3. Students will evaluate the role of natural selection in the development of the theory of evolution.

TEACHING PROCEDURE

Introduction and Mental Set

Distribute a handout of the male and female reproductive systems. Ask the students to identify the relevant parts.

Discussion

1. **What are the parts of the male reproductive system?**
   a. Testicles
   b. Vas deferens
   c. Epididymis
   d. Penis
   e. Seminal vesicles
   f. Prostate gland
   g. Cowpers gland
   h. Retractor muscle
   i. Sheath

2. **Create a PowerPoint™ slide of figure 13.4 (page 205 of textbook) for display and discussion.**

3. **Why are testicles suspended away from the male's body?**
   Sperm must be at a temperature lower than the animal's body.

4. **What hormone controls the animal's libido (sex drive) and stimulates the development of sex characteristics?**
   Testosterone

5. **What purposes do the accessory glands of the male reproductive tract serve?**

   a. The seminal vessels function to secrete a fluid that is mixed with the sperm to:
      - Protect the sperm, and
      - Provide a mechanism by which the sperm can be transported.

   b. The seminal vessels also act as a holding place for the sperm.

   c. The Cowper's gland secretes fluid that helps cleanse the urethra before the sperm is passed along the tube.

   d. The prostate gland secretes fluid that provides nutrients for the sperm and to expel the semen during the mating process.

   e. The organ that deposits sperm is the penis.

   f. The prepuce sheath protects the penis from injury.

6. What are the parts of the female reproductive system?

   a. Ovary
   b. Fallopian tube
   c. Uterus
   d. Cervix
   e. Vagina
   f. Vulva
   g. Clitoris

7. **What hormones control the female reproductive system?**

   a. Estrogen
   b. Progesterone
   c. Luteinizing hormone (LH)

8. Discuss the functions and phase of the parts of the female reproductive system.

a. The ovaries produce the egg and the hormones estrogen and progesterone.

b. The fallopian tubes transport the eggs to the uterus.
- Within the fallopian tubes, the egg is united with the sperm.

c. The fertilized egg develops in the uterus.

d. The cervix has glands that seal off the uterus from foreign matter.
- When the animal comes into heat, the cervix opens to allow the sperm into the fallopian tubes.

e. The vagina accepts the male's penis during mating.
- When the fetus is mature, the vagina serves as the birth canal.

f. The clitoris provides stimulation during mating process.

9. What hormones play roles in reproduction?

a. Male

Testosterone control the animal's sex drive

b. Female

- **Follicle stimulating hormone (FSH)**: stimulates the ovary to produce a follicle

- **Estrogen**: produced by follicle, stimulates the rest of the reproductive system to prepare for the reception of the egg.

- **Luteinizing hormone (LH)**: causes the development of the corpus luteum

- **Progesterone**: causes the walls of the uterus to thicken to receive the fertilized egg

SUMMARY

All the parts of the reproductive systems must function properly for conception to take place. The hormone and chemical interaction that make this possible is very complicated and must be healthy for reproduction to occur. Some drugs given for other health problems can affect the chemical balance of the reproduction system.

Evaluation

Written test

Individual Learning Activity

Lesson: Reproductive Systems of the Male and Female

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Describe the parts and functions of the male reproductive system.
2. Describe the parts and functions of the female reproductive system.
3. Analyze the functions of the hormones that control reproduction.
4. Describe the phases of the female reproductive cycle.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**
2. **At least two credible references must be properly cited.**
3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**
4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

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Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Reproductive Systems of the Male and Female

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Describe the parts and functions of the male reproductive system.
2. Describe the parts and functions of the female reproductive system.
3. Analyze the functions of the hormones that control reproduction.
4. Describe the phases of the female reproductive cycle.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

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Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Reproductive Systems of the Male and Female

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it's relevant to your life.

1. Describe the parts and functions of the male reproductive system.
2. Describe the parts and functions of the female reproductive system.
3. Analyze the functions of the hormones that control reproduction.
4. Describe the phases of the female reproductive cycle.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
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Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. Why are the testicles suspended away from the male's body?

2. What hormone controls the animal's sex drive and the development of sex characteristics?

3. The _____ produce the egg and the hormones estrogen and progesterone.

4. The _____ transport the eggs to the uterus.

5. The _____ has glands that seal off the uterus from foreign matter.

6. What are two hormones that play a role in reproduction?
   a.
   b.

Lesson Evaluation Key

1. Sperm must be at a lower temperature than the animal's body
2. Testosterone
3. Ovaries
4. Fallopian tubes
5. Cervix
6. FSH, LH, estrogen, progesterone, testosterone

Teacher's Notes

Essential Question:

How do the male and female reproductive systems function?

Vocabulary

Testicles
Ovary
Testicles
Seminal Vesicles
Cervix

Unit 4: Scientific Selection of Agricultural Animals

Lesson 1: Genetics in the Selection Process

Objectives:

1. Describe how the concept of heritability is used in the selection of livestock.
2. Utilize computers to predict genetic differences in animals.
3. Utilize performance data in the selection of livestock.
4. Describe Expected Progeny Difference (EPD).

Teaching Time: 2 hours

Essential Question:

How is genetic data used to select livestock?

Unit Understandings, Themes, and Concepts:

1. Students will learn how Performance Data is compiled and analyzed for utilization in the selection of livestock.
2. Students will also learn some of the relevant terms of Performance Data, with a focus on the concept of Expected Progeny Difference.

Primary Learning Goals:

1. Students will describe how the concept of heritability is used in the selection of livestock and utilize computers to predict genetic differences in animals.
2. Students will utilize performance data in the selection of livestock and describe Expected Progeny Difference (EPD).

Assessment Method/Type:

_____ Constructed Response	_____ Peer Assessment
__X__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Herren, Ray V. *The Science of Animal Agriculture*. Delmar Publishers, Inc. Albany, NY.

Flanders, Frank & Ray Herren. *The Science of Animal Agriculture Lab Manual.* Delmar Publishers, Inc. Albany, NY.

Materials and Equipment:

Table 11-8 from the *Science of Animal Agriculture* textbook.

POWERPOINTS™:

Self-generated or use resources from The University of Georgia Cooperative Extension.

Performance Standards:

The student applies genetic principles to animal selection, breeding, and production, including

1. Describing how the concept of heritability is used in the selection of livestock.
2. Predicting phenotypic and genotypic characteristics in animals.
3. Utilizing performance data in the selection of livestock.
4. Describing Expected Progeny Difference (EPD).

Academic Standards:

1. Students will relate messages and themes from one subject area to those in another area.

2. Students will enhance reading in all curriculum areas.

3. Students will analyze how biological traits are passed on to successive generations.

4. Students will use the basic laws of probability.

5. Students will solve problems (using appropriate technology).

6. Students will describe the relationships between changes in DNA and potential appearance of new traits, including:
   a. Alterations during replication
   b. Insertions
   c. Deletions
   d. Substitutions
   e. Mutagenic factors that can alter DNA
   f. High energy radiation (x-rays and ultraviolet)
   g. Chemical
   h. Use of DNA technology in forensics, medicine, and agriculture

7. Students will offer own opinion confidently without being domineering, including:
   a. Contributing voluntarily and responding directly when solicited by teacher or discussion leader
   b. Giving reasons to support opinions expressed

TEACHING PROCEDURE

Introduction and Mental Set

Provide each student with a copy of page 167, Table 11-8 from the referenced textbook book which shows the heritability estimates of cattle, hogs, and sheep. Ask the students to analyze the tables:

1. What traits are highly hereditary?
2. Which traits are least likely to be hereditary?

Discussion:

1. What does the term heritability mean?
The measure of how much of a trait was passed on to the offspring by genes.

2. Which traits are highly heritable in livestock?
a. Carcass traits
b. Rib eye area
c. Backfat thickness
d. Percentage of muscle

3. Which traits are low in heritability?
a. Weaning weight (depends on environment)
b. Number of offspring born (hogs and sheep)

4. Discuss with the class how all these factors must be considered when selecting market or breeding animals.

5. Contact the IT department about utilizing a computer program to generate performance data.

6. What are the different types of performance data which are utilized by the livestock industry?
a. Indexes
b. Mothering ability
c. Estimated breeding value (EBV)

7. If possible, use performance data to rank a class of animals.
If live animals are not available, utilize a livestock judging video to match performance data to those animals.

8. What is an expected progeny difference?

a. Used to predict the differences that can be expected in the offspring of a particular sire over those of other bulls used as a reference.

b. Show students how to use EPDs in selecting livestock.

Angus Heifers				
Number	**Birth Weight**	**Weaning Weight**	**Yearling Weight**	**Milk**
1	2.0	36	57	12
2	6.3	24	41	8
3	1.2	35	62	17
4	1.8	38	54	10

1) Rank these Angus heifers as they will be used as replacements in a purebred herd which sells bulls to commercial producers and saves replacement females. Feed and labor resources are good.
2) Explain to students that low-birthweight EPDs are good for calving ease.
3) Weaning weight and yearling weight EPDs are growth traits which should be high.
4) Milk EPDs should be high if females will be retained.

Note: On data the heifers should be ranked 3-1-4-2

9. Activity
Chapter 11 (Animal Genetics) in the referenced lab manual.

SUMMARY

How is heritability used in livestock selection?

1. Students should be aware that computers are used in generating performance data.
2. Students should be able to rank classes of livestock by using different types of performance data.

Evaluation

Activity: EPD Evaluation
Activity: Lab Manual exercise
Written test

Individual Learning Activity

Lesson: Genetics in the Selection Process

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Describe how the concept of heritability is used in the selection of livestock.
2. Utilize computers to predict genetic differences in animals.
3. Utilize performance data in the selection of livestock.
4. Describe Expected Progeny Difference (EPD).

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:

Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
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Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Genetics in the Selection Process

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Describe how the concept of heritability is used in the selection of livestock.
2. Utilize computers to predict genetic differences in animals.
3. Utilize performance data in the selection of livestock.
4. Describe Expected Progeny Difference (EPD).

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught
2. A PowerPoint™ of at least twelve slides
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be submitted to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. It can be written or oral but should show the instructor that the class understands and has retained the material taught.

Due Date:

Points/Grade Available:

All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
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Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
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Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Genetics in the Selection Process

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Describe how the concept of heritability is used in the selection of livestock.
2. Utilize computers to predict genetic differences in animals.
3. Utilize performance data in the selection of livestock.
4. Describe Expected Progeny Difference (EPD).

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
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Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. What are some traits that are highly heritable in livestock?
   a.
   b.
   c.

2. What does EPD stand for?

3. How are EPD's used?

4. Rank these Angus heifers as they will be used as replacements in a purebred herd which sells bulls to commercial producers and saves replacement females. Feed and labor resources are good.

Angus Heifers				
Number	**Birth Weight**	**Weaning Weight**	**Yearling Weight**	**Milk**
1	2.0	36	57	12
2	6.3	24	41	8
3	1.2	35	62	17
4	1.8	38	54	10

Lesson Evaluation Key

1. Traits that are highly heritable in livestock
   a. Carcass traits
   b. Rib eye area
   c. Backfat thickness
   d. Percentage of muscle

2. Expected Progeny Difference

3. To predict the performance of offspring

4. 3-1-4-2

Teacher's Notes

Essential Question:

How is genetic data used to select livestock?

Vocabulary

Heritability
Indexes
Performance data

Unit 4: Scientific Selection of Agricultural Animals

Lesson 2: Livestock Selection

Objectives:

1. Trace the stages in the development of modern swine.
2. Discuss problems associated with overly-muscled pigs.
3. Interpret the reasoning behind the selection of sex character.
4. Rationalize the selection of animals for structural soundness.
5. Outline the physical characteristics associated with growth in animals.
6. Describe the modern beef animal.

Teaching Time: 3 Hours

Essential Question:

How are livestock selected phenotypically?

Unit Understandings, Themes, and Concepts:

1. Students will learn the phenotypic traits used to evaluate and select livestock.
2. Students will learn how these traits relate to productivity, as well as what the ideal animal looks like.

Primary Learning Goals:

1. Students will trace the stages in development of modern swine and discuss the problems associated with overly muscled pigs.

2. Students will interpret the reasoning behind the selection of sex character.
3. Students will rationalize the selection of animals for structural soundness and outline the physical characteristics associated with growth in animals.
4. Students will describe the modern beef animal.

Assessment Method/Type:

_____ Constructed Response	__x__ Peer Assessment
__X__ Combined Methods	_____ Selected Response
_____ Informal Checks	_____ Self-Assessment

References:

Herren, Ray V. *The Science of Animal Agriculture*. Delmar Publishers, Inc. Albany, NY.

Materials and Equipment:

SMART Board®
Selection videos (instructor's choice)

Performance Standards:

The student applies scientific methods of animal selection and explains the advantages and disadvantages, including:

1. Tracing the stages in the development of modern swine.
2. Discussing problems associated with overly muscled pigs.
3. Interpreting the reasoning for the selection of sex character in agricultural animals.
4. Outlining selection criteria for specific agricultural animals and uses.

5. Outlining the physical characteristics associated with growth in animals.
6. Comparing and contrasting the characteristics of modern beef, swine, and dairy animals with those of their ancestors.

Academic Standards:

1. Students will understand new words found in subject area texts.
2. Students will understand important features of the process of scientific inquiry.
3. Students will enhance reading in all curriculum areas.
4. Students will analyze how biological traits are passed on to successive generations.
5. Students will evaluate the role of natural selection in the development of the theory of evolution.

TEACHING PROCEDURE

Introduction and Mental Set

1. Show videos of modern swine and cattle to demonstrate the type of livestock that are being used in our industry.

2. Also show videos of cattle and hogs that were raised forty to fifty years ago to show the contrast in types.

Discussion

1. Use the text to illustrate the change in the swine industry over the last thirty years.

a. Lard hogs
b. Large framed, high arch hogs
c. Moderate, rugged hogs
d. Ultra-lean, high cut ability hogs

2. What are the problems associated with overly muscled pigs?

a. **Porcine Stress Syndrome (PSS):** When under stress, animals have muscle tremors and twitching, red splotches develop, and they suffer a sudden death.

b. **PSE Pork:** Pale, soft and exudative pork. The meat is pale in color, does not have much marbling, and is soft and watery. This is the result of PSS.

c. **Reproductive Problems:**

- Boars that are heavily muscled and tight wound have problems moving about and mounting females that are in heat. These boars often have low sperm counts.
- Gilts that are extremely heavy muscled are less fertile and usually give birth to fewer pigs.

3. Why is it important to select for sex character?

a. Sex characteristics are an indication that the female is producing enough hormones to cause the female to conceive efficiently.

b. Problems with sex character:

- Pin nipples
- Blind nipples
- Inverted nipples
- Infantile vulva
- Testicles
- Viable
- Sheaths

Bulls should look like bulls, and females should be feminine.

4. Why is structural soundness so critical in the selection process?

a. Structural soundness refers to skeletal design and how well the bones support the animal's body.
b. Breeding animals must be sound structurally to reproduce.
c. Boars and bulls that have structural problems are less likely than sound males to be interested in breeding.
d. The majority of the hogs in this country are raised in confinement or concrete. This makes structure problems more critical.
e. Cattle and sheep must have the correct set to their legs.

Use the text to illustrate the correct leg placement of cattle.

5. Define the following:

a. **Ligaments:** the tough, dense, fibrous bands of tissue that connect bone or support viscera
b. **Pasterns:** the part of an animal leg that connects the cannon with the foot or hoof.
c. **Splayfooted**: condition in an animal when its front feet are turned out.

d. **Pigeon-toed**: condition in an animal when its front feet are turned in
e. **Cow-hocked**: a condition in which an animal's back feet are splayed out and the hocks are turned in.
f. **Cannon bone**: a bone in hoofed mammals that extends from the knee or the hock to the fetlock or pastern
g. **Frame size**: a score that depicts the size and weight of an animal at maturity. The measure is taken at the shoulder or at the hip.
h. Hip height: a measurement taken on the highest point of the hip of cattle at a given age. This is an indication of the frame size and the weight of an animal at maturity.

6. What are the physical characteristics of growing animals?

a. Today's modern industry places much emphasis on capacity and depth of body.
b. Animals should be wide-based and have a wide chest floor to give them more dimension of size. This also adds to feed efficiency and growth.
c. Long cannon bones usually means that animals will be larger framed and later maturing.
d. Long-necked animals have also shown more growth potential.

Use the textbook to illustrate different frame scores in cattle. Show examples of small, medium, and large framed animals**.**

7. What should the modern beef animal look like?

a. Many factors must be combined to produce modern beef cattle.
b. The consumer wants beef that is tender, flavorful, and affordable.
c. Consumers do not want meat with excessive fat.
d. Consumers are selective about the size of the cuts of meat.
e. Ribeyes larger than fifteen inches may be too large for the average consumer.

f. Packers usually want a carcass that weighs between 600 and 700 pounds.
g. Cattle should be medium framed, heavy muscled, and with approximately 1050-1250 pounds at slaughter

Show videos or pictures of modern beef cattle.

Show PowerPoint™ presentation.

SUMMARY

1. How has the swine industry changed in the last 30 years?
2. What problems did the swine industry face when they changed the type of hogs?
3. Why is sex character important in males and females?
4. Why is structural correctness so important in breeding animals?
5. What are the physical characteristics of growth in livestock?
6. What factors must be considered in producing the modern beef animal?

Evaluation

Written test

Individual Learning Activity

Lesson: Livestock Selection

Assignment: Choose one of the topics below and research it. Write a report on your findings that answers the question or explains the concept and shows why it is relevant to your life.

1. Trace the stages in the development of modern swine.
2. Discuss problems associated with overly muscled pigs.
3. Interpret the reasoning behind the selection of sex character.
4. Rationalize the selection of animals for structural soundness.
5. Outline the physical characteristics associated with growth in animals.
6. Describe the modern beef animal.

Minimum Requirements:

1. **Paper must be typed in 12-point font and at least one page in length. The paper may be double-spaced.**

2. **At least two credible references must be properly cited.**

3. **All work must be original. No plagiarism! Any use of another's ideas without giving credit will result in a zero.**

4. **Papers will be graded on content (amount of good information, accuracy, etc.) and mechanics (grammar, spelling, and punctuation.)**

Due Date:
Points/Grade Available:

Individual Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The paper should include information and issues of state and local importance.	35 pts.
Critical Analysis - logical process of analyzing and reporting information that examines and explains the topic selected. The paper should go beyond simply listing facts and must include why the concept is relevant to the student's life.	25 pts.
Organization - The paper should have an orderly structure that demonstrates a logical flow of ideas.	15 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the paper should meet all specifications and be executed following rules of proper written English.	15 pts.

Group Learning Activity

Lesson: Livestock Selection

Assignment: Choose one of the topics below and research it. With your group, prepare a presentation to teach the class your concept.

1. Trace the stages in the development of modern swine.
2. Discuss problems associated with overly muscled pigs.
3. Interpret the reasoning behind the selection of sex character.
4. Rationalize the selection of animals for structural soundness.
5. Outline the physical characteristics associated with growth in animals.
6. Describe the modern beef animal.

Your presentation should include the following:

1. A lesson plan outlining exactly what your group will teach and how the information will be taught.
2. A PowerPoint™ of at least twelve slides.
3. Notes containing the information the class will be responsible for (these can be printed and given to the class, written on the board, or part of the PowerPoint™). A copy of the notes will be turned in to the instructor.
4. Some type of interactive activity for the class (game, problem solving activity, interactive model, etc.)
5. Your group must also prepare an assessment for the class. This assessment can be written or oral but should show the instructor that the class understands and has retained the material being taught.

Due Date:

Points/Grade Available:

Group Learning Activity Rubric

Lesson Plan – The group submits a thorough, detailed lesson plan highlighting the content and organization of their lesson.	10 pts.
PowerPoint™ – The group presents a PowerPoint™ of at least twelve slides that contains information and pictures vital to the lesson with additional information or examples for enhancement.	20 pts.
Interactive Activity – Some type of interactive activity is used to help teach the lesson. The activity should contribute to the mastery of content and involve the entire class in some way.	15 pts.
Assessment – A fair, thorough assessment is prepared and administered based on the information presented to the class. Poor grades on the assessment by a few members of the class are excusable, but if the entire class has difficulty, the points awarded in this category may be lowered at the discretion of the instructor.	15 pts.
Content – The group should cover the concept (within reason) in entirety. The group may study actual lesson plans to help decide what should be emphasized.	25 pts.
Overall Effect – The group is prepared, enthusiastic, and interesting, and the lesson flows smoothly.	15 pts.

Presentation Learning Activity

Lesson: Livestock Selection

Assignment: Choose one of the topics below, research it, and prepare a presentation that answers the question or explains the concept and shows why it is relevant to your life.

1. Trace the stages in the development of modern swine.
2. Discuss problems associated with overly muscled pigs.
3. Interpret the reasoning behind the selection of sex character.
4. Rationalize the selection of animals for structural soundness.
5. Outline the physical characteristics associated with growth in animals.
6. Describe the modern beef animal.

Minimum Requirements:

Oral Report Option

1. Write a paper on one of the topics and orally present your work to the class.
2. Paper may be double-spaced and should be at least one page in length, resulting in a two-to-five-minute presentation.
3. At least two references must be properly cited.
4. The presentation of the report will be graded secondary to the content of the paper.

PowerPoint™ Option

1. Presentation should be at least ten slides in length
2. Presentation should include at least four photos.
3. Presentation should be two to five minutes in length.
4. Grammar and spelling will be graded by the same standards as any other written assignment.
5. At least two references must be properly cited.

Poster Option

1. Prepare a poster that answers/explains one of the topics. You will present your poster to the class.
2. Your poster should include both text and graphics that help communicate your research.
3. At least two sources of information should be properly cited on the back of the poster.
4. Neatness and appearance of the poster will be graded.
5. Poster presentation should last two to five minutes.

Due Date:

Points/Grade Available:

For all presentations: All work must be original. No plagiarism! Any use of another's work or ideas without giving proper credit will result in a zero.

Presentation Learning Activity Rubric

Content - offers current information on the topic chosen, thoroughly covers each aspect of the question, and demonstrates understanding and mastery of the lesson. The presentation should include information and issues of state and local importance.	40 pts.
Critical Analysis/Organization – The presentation shows a logical process of analyzing and reporting information that examines and explains the topic selected. The presentation should go beyond simply listing facts and must include why the concept is relevant to the student's life.	20 pts.
Presentation – The student makes a genuine effort to present, not just read the material. The student should present with confidence using techniques like eye contact and voice inflexion to make his or her point. Although content takes precedence over presentation, the experience of successfully presenting in front of a class is part of the basis of this assignment.	25 pts.
Mechanics - spelling, grammar, punctuation, font size, double spacing, citation, etc. Essentially, the presentation should meet all guidelines set forth and should be executed in proper written English. For the poster, this includes neatness and appearance.	15 pts.

Lesson Evaluation

1. What are two problems associated with overly muscled pigs?
   a.
   b.

2. What are three problems that can affect sex characteristics?
   a.
   b.
   c.

3. _____ are the tough, dense, fibrous bands of tissue that connect bone or support viscera.

4. _____ is a bone in hoofed mammals that extends from the knee or the hock to the fetlock or pastern.

5. _____ is a condition in an animal when its front feet are turned out.

6. What qualities are consumers looking for in meat?

7. What is one indicator of growth or growth potential?

Lesson Evaluation Key

1. Two problems associated with overly muscled pigs
   a. PSS
   b. PSE meat
   c. Reproductive problems

2. Three problems that can affect sex characteristics
   a. Pin nipples
   b. Blind nipples
   c. Inverted nipples
   d. Infantile vulva
   e. Problems with testicles

3. Ligaments

4. Cannon bone

5. Splayfooted

6. Tender, flavorful, free of excess fat, affordable

7. Body capacity, depth and width; long cannon bone, long neck

Teacher's Notes

Essential Question:

How are livestock selected phenotypically?

Vocabulary

Swine
Porcine Stress Syndrome
Sex characteristic
Cow-hocked
Ligaments

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