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CTE Standards Unpacking
Fundamental Animal Science

Course: Fundamental Animal Science
Course Description: Fundamental Animal Science will address the basic knowledge and skills necessary to care for and meet the needs of animals, along with soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. Topics addressed in the course include: animal anatomy and physiology, animal health, safely working with animals, animal nutrition, reproductive systems, animal performance, animal industry issues, and employability. Utilizing appropriate equipment and technology should enhance classroom and laboratory content. Algebra, English, Biology and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises and field trips. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Livestock Evaluation Career Development Event and related Proficiency Awards. Each student will be expected to maintain a SAE.
Career Cluster: Agriculture, Food and Natural Resources
Prerequisites: Recommended: Introduction to AFNR
Program of Study Application: Fundamental Animal Science is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Animal Systems pathway. Fundamental Animal Science is preceded by a Cluster course and is recommended to be taken prior to participation in Advanced Animal Science or Ag Biotechnology.

<table>
<tr><td colspan="3">INDICATOR #AN 1: Examine animal anatomy and physiology</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.1 (Webb Level: 1 Recall): Recognize animals by species, gender or use.</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.2 (Webb Level: 1 Recall): Identify the parts of an animal’s anatomy.</td></tr>
<tr><td>Knowledge (Factual):
-Types, species, genders of animals

-Livestock breeds

-Animal anatomy</td><td>Understand (Conceptual):
-The importance of the relationships between body systems</td><td>Do (Application):
-Dissect a fetal pig

-Dissect animal organs

-Compare and contrast animal body systems

-Compare and contrast milk animals versus meat animals</td></tr>
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Benchmarks:
Students will be assessed on their ability to:

- Label anatomical parts related to animal body systems.
- Identify wholesale and retail meat cuts.
- Compare and contrast animal body systems.
- Compare and contrast milk animals versus meat animals.

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): English: 1) 9-12 W.4 - Produce writing that is appropriate for the task or audience.	**Sample Performance Task Aligned to the Academic Standard(s):** -Write a compare and contrast essay on the differences between animal breeds, types of animals, uses for animals, etcetera.

INDICATOR #AN 2: **Examine animal health**

SUB-INDICATOR 2.1 (Webb Level: 2 Skill/Concept): Evaluate a subject animal to determine the nature of its health.

SUB-INDICATOR 2.2 (Webb Level: 1 Recall): Understand proper usage and effects of animal health products.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Animal diseases and ailments -Vitals of specific animals -Withdrawal times for specific medications	-Understand that vitals are different between animal species -Withdrawal times for meat animals	-Compare and contrast treatment options -Check an animal's vitals -Compare and contrast needle sizes and gauges -Visit a veterinary clinic -Diagnose animal ailments

Benchmarks:
Students will be assessed on their ability to:

- Correctly administer a vaccination or antibiotic.
- Calculate proper doses of medications.
- Read animal health cases and discuss treatment options.

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Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): English: 1) 9-12 W.4 - Produce writing that is appropriate for the task or audience. Math: 2) HSN.Q.A.3 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**Sample Performance Task Aligned to the Academic Standard(s):** -Complete an animal health statement after examining an animals -Fill a syringe with the appropriate amount of medication and calculate dosage.

INDICATOR #AN 3: **Describe practices for safely working with animals**		
SUB-INDICATOR 3.1 (Webb Level: 1 Recall): Judge an animal's behavior to safely work with it.		
SUB-INDICATOR 3.2 (Webb Level: 2 Skill/Concept): Examine animal housing, equipment and handling facilities for the safety of animals and handlers.		
SUB-INDICATOR 3.3 (Webb Level: 2 Skill/Concept): Select management practices to reduce the effects of animal production on the environment.		
Knowledge (Factual): -Flight zone, point of balance -Restraint techniques -Living requirements for various species -Zoning regulations -Animal behavior -Animal needs for space, feed, water, etc.	**Understand (Conceptual):** -Effects of animal production on the environment -How to use a flight zone to move livestock -Signs of animal behavior and reactions	**Do (Application):** -Create a life size flight zone -Compare and contrast facilities for species -Compare manure handling techniques -Visit an overgrazed pasture

Benchmarks:
Students will be assessed on their ability to:

- Demonstrate how a flight zone works.
- Design an animal facility.
- Develop a waste management plan.
- Read a study on the effects of animal produced methane on the environment.
- Develop a grazing program to reduce the effects of over grazing.

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 1) 9-12 W.4 - Produce writing that is appropriate for the task or audience. Math: HSN.Q.A.2 - Define appropriate quantities for the purpose of descriptive modeling.	-Create an informational flyer about the behavior of a given animal species -Design an animal facility to scale. Demonstrate that the design is a scale model of the final animal facility.

INDICATOR #AN 4: **Distinguish elements of proper animal nutrition.**

SUB-INDICATOR 4.1 (Webb Level: 2 Skill/Concept): Compare an animal's differing nutritional needs throughout its life cycle.

SUB-INDICATOR 4.2 (Webb Level: 1 Recall): Prepare a feed ration to fulfill a given animal's nutrient requirements.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Developmental stages of animals -Feedstuff classifications -Types of digestive systems	-Nutritional needs of animals based on developmental stages -How climate affects nutritional needs -Nutritional needs based on digestive systems	-Evaluate a nutrition label -Compare and contrast digestive systems

Benchmarks:
Students will be assessed on their ability to:

- Create diagram of different phases of animal life cycles.
- Develop a ration using a Pearson's Square.
- Categorize nutrients.
- Develop a ration that meets the nutritional needs of an animal.
- Create a total mixed ration for a feed lot.
- Create a model digestive system.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 1) 9-12 R1.1 – Interpreting a text explicitly and drawing inferences. 2) 9-12 W.4 - Produce writing that is appropriate for the task or audience. Math: HSA.REI.C.6 - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	-Determine the nutritive quality of a feed label -Compose a research paper about a nutrition-related illness -Determine the proper mix of feedstuffs in a ration using a Pearson's Square as an algorithm.

INDICATOR #AN 5: **Study the reproductive system of animals.**

SUB-INDICATOR 5.1 (Webb Level: 1 Recall): Examine male and female reproductive systems.

SUB-INDICATOR 5.2 (Webb Level: 1 Recall): Discuss reproductive cycles and breeding techniques.

SUB-INDICATOR 5.3 (Webb Level: 2 Skill/Concept): Evaluate an animal to determine breeding soundness and readiness.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Reproductive anatomy -Estrous cycles -Breeding methods	-Benefits of various breeding methods -Structural correctness	-Graph gestational periods of animals by species -Research estrous cycles and synchronization methods

		-Dissect reproductive organs

Benchmarks:
Students will be assessed on their ability to:

- Develop a breeding plan for a herd of animals.
- Analyze the results of semen tests.

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): English: 9-12 RI.3 – Analyzing sequence and interaction.	**Sample Performance Task Aligned to the Academic Standard(s):** -Analyze the graph of bovine estrous cycles.

INDICATOR #AN 6: **Identify factors that affect an animal's performance.**		
SUB-INDICATOR 6.1 (Webb Level: 2 Skill/Concept): Predict genetic outcomes.		
SUB-INDICATOR 6.2 (Webb Level: 2 Skill/Concept): Determine optimum performance levels for a given animal species.		
SUB-INDICATOR 6.3 (Webb Level: 2 Skill/Concept): Assess an animal to determine if it has reached its optimum performance level.		
Knowledge (Factual): -Genotype, phenotype -Dominant, recessive traits -External animal anatomy -Expected progeny difference (EPD) -Pedigree	**Understand (Conceptual):** -Implications of genetic variation -Ideal animal qualifications -Understand components of a pedigree	**Do (Application):** -Complete a Punnett Square -Compare and contrast animals -Read an EPD -Evaluate sire performance records -Use EPD to select ideal animals

Benchmarks:
Students will be assessed on their ability to:

- Use a Punnett Square to determine genetic inheritance.
- Rank a group of animals and write a report defending your decision.
- Rank animals based on EPD.
- Assess a livestock herd for keep/cull.
- Read a pedigree.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Science: HS-LS3-2 - Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.	-Read a pedigree and discuss genetic variation through generations
Math: HSS.IC.B.6 - Evaluate reports based on data.	-Interpret an EPD, using the contained data to determine the ideal bull for a herd.
English: 9-12 W.4 - Produce writing that is appropriate for the task or audience.	-Write an explanation on how to read EPD reports

INDICATOR #AN 7: **Examine animal industry issues.**
SUB-INDICATOR 7.1 (Webb Level: 2 Skill/Concept): Compare and contrast consumer concerns related to animal food products.
SUB-INDICATOR 7.2 (Webb Level: 2 Skill/Concept): Analyze consumer concern related to animal welfare.

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Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-HACCP -Processing techniques -Food labeling -Welfare groups -Humane Society of United States vs. Local humane society	-Hormone level affects on humans -Labels on food products (natural, anti-biotic free, etc.) -Common humane animal processing practices	-Compare and contrast animal rights vs. Welfare -Compare and contrast hormone levels of foods -Compare and contrast animal welfare groups

Benchmarks:
Students will be assessed on their ability to:

- Create a brochure on humane processing practices
- Research the meanings of various food labels (all natural, antibiotic free, raised without antibiotics, gluten free, etc.)

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 1) 9-12 W.4 - Produce writing that is appropriate for the task or audience. 2) 9-12 W.6 – Use technology, including the internet, to produce an individual writing product.	-Write a letter to an animal welfare group defending humane animal practices -Use computer software to research humane animal practice. Then create a infographic defending humane animal practices

INDICATOR #AN 8: **Develop employability skills related to the Animal Systems Pathway.**

SUB-INDICATOR 8.1 (Webb Level: 2 Skill/Concept): Develop soft skills to enhance employability.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Proper communication etiquette -Proper interview apparel -How to give a proper hand shake -How to tie a tie	-Importance of employability skills in careers -The dos and don'ts of job interviews	-Job shadow -Tour industries -Write e-mails to industry professionals

Benchmarks:
Students will be assessed on their ability to:

- Perform mock interview.
- Compose a cover letter and resume.
- Develop questions for an industry tour.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 9-12 W.4 - Produce writing that is appropriate for the task or audience.	-Write a thank-you or follow up letter after conducting an interview

Additional Resources
Text: Modern Livestock and Poultry Production, Gillespie and Flanders
http://www.ansi.okstate.edu/breeds
4D Vision Animal Models
Temple Grandin movie and worksheet in Communities of Practice. Also visit www.Grandin.com
Youth for the Quality Care of Animals training: http://yqca.org/