

Animal Science

Instructional Framework

An instructional framework provides educators with a list of benchmark statements aligned to Common Core and national content area standards for a given course or program. The Missouri Animal Science Instructional Framework lists a sequence of content, organized into distinct units of instruction. Sample activities and potential Common Core related enhancements are provided.

	Common Core Standards	National Standards (AFNR)	Activities	Enhancements
A. Nutrition				
1. Identify the importance of nutrition to agriculture.	RST.9-10.1 RST.9-10.2 SL.9-10.1.a SL.9-10.2		1. Students will evaluate a feed tag to compare and contrast different feed nutrients. Students will hear a speaker for a feed specialist to increase level of learning.	
2. Compare and contrast the digestive system of livestock.	RST.9-10.4 RST.9-10.5 RST.9-10.9		1. Students will construct the digestive tract of the different animal systems. Students will create comparative chart on the different digestive systems.	1. Obtain two different digestive tracts for students to compare and contrast in essay form.
3. Describe energy's role in nutrition	RST.9-10.4 RST.9-10.5		1. Students will keep track of what they eat for a week to determine what food gives them energy.	
4. Describe protein's role in nutrition	RST.9-10.4 RST.9-10.5		1. Students will use the person square method to create an ideal protein values in feed.	

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5. Describe mineral's role in nutrition.	RST.9-10.4 RST.9-10.5		1. Students will watch a video of animal abnormalities and then link them to mineral deficiencies.	
6. Describe vitamins' role in nutrition.	RST.9-10.4 RST.9-10.5		1. Students formulate a nutrition plan for various species, including the necessary vitamin supplements that would be needed and justify the need.	
7. Describe the role of water in nutrition.	RST.9-10.4 RST.9-10.5		1. Students perform different tests to evaluate the quality of different water samples.	1. Have students write a conclusion of the tests and why they think certain water samples tested as they did.
8. Describe environmental effects on nutrition.	RST.9-10.4 RST.9-10.5		1. Students will create a weather chart to record the weather factors for a week and then research ways weather affects animal behaviors.	1. Have students create model that compares the environmental factors if they lived in different states in the U.S.
9. Formulate a ration for different classes of livestock.			1. Students will use the person square method to formulate different feed rations.	1. Have students calculate and mix actual ration of different feedstuffs and then calculate actual cost to make.
B. Genetics				
1. Describe the importance of genetics in agriculture.	S-MD.2 S-CP.7 RST.9-10.1		1. Students will explore the careers that are related to genetics. Students will	

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	RST.9-10.2		predict the phenotypic and genotypic ratios of the offspring of a dihybrid cross using a Punnett square.	
2. Describe the basic building blocks of genetics	RST.9-10.4 RST.9-10.5 SL.9-10.1.a SL.9-10.2		1. Students will draw and label the parts of an animal cell, then discuss how DNA and RNA affect the genetics of livestock.	
3. Describe animal cell division	S-IC.6 RST.9-10.1 RST.9-10.2 RST.9-10.4 RST.9-10.5		1. Students will compare the different hereditary characteristics carried by chromosomes in humans, cattle, swine, etc.	1. Students can create and present an imaginary animal that could combine all characteristics and present to the class.
4. Describe basis principles of genetics	RST.9-10.4 RST.9-10.5 SL.9-10.1.a SL.9-10.2		1. Students will analyze the risks and benefits of genetic engineering to society.	
5. Describe selection tools for genetic improvement of beef	S-ID.5 S-IC.1 S-IC.3		1. Students will use genetic factors and EPD's in crossbreeding to improve beef genetics.	1. Visit a local beef farm and have owner explain why they select certain traits for certain animals.
6. Describe selection tools for genetic improvement of dairy herds.	S-ID.5 S-IC.1 S-IC.3		1. Students will use EPD chart to evaluate the different factors of sire selection.	
7. Describe selection tools for genetic improvement of sheep.	S-ID.5 S-IC.1 S-IC.3 RST.9-10.4 RST.9-10.5		1. Students will use sire summary data charts to select animals for breeding purposes.	

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8. Describe selection tools for genetic improvement of swine	RST.9-10.4 RST.9-10.5		1. Students will discuss breeds of swine, compare and contrast those breeds for their hybrid vigor and breeding characteristics.	
C. Reproduction				
1. Identify the importance of reproduction in livestock production.	RST.9-10.1 RST.9-10.2		1. Students watch video, <u>Beef Reproduction</u> , and discuss questions as a class.	1. Obtain two different reproductive tracts for students to compare and contrast in essay form.
2. Describe the hormonal system in livestock reproduction.	RST.9-10.4 RST.9-10.5		1. Have students trace/draw to show how different hormones affect what parts of the reproductive cycle and when.	1. Have students use a drawing to compare and contrast a livestock species to a human hormonal system.
3. Describe the reproductive cycle of common production livestock.	RST.9-10.4 RST.9-10.5		1. Students will fill out a chart to help them identify key components of the reproductive cycle of select livestock.	
4. Sequence the fetal development stages of livestock.	RST.9-10.4 RST.9-10.5 SL.9-10.1.a SL.9-10.2 SL.9-10.4		1. Have students select a species of animal, not taught in class, and chart information to share with others.	1. Use a simple incubator to have students conduct research on the hatching of chicken eggs. Try different temperatures, humidity, etc.
5. Describe the effects of the environment on the reproductive cycle.	RST.9-10.4 RST.9-10.5		1. Have students set up a breeding schedule for a species of livestock considering the factors of	1. Have students research different causes of reproductive infertility caused by environmental

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			photo period, nutrition, and environmental conditions.	conditions.
6. Describe how management and technology are utilized to affect the reproductive cycle.	RST.9-10.4 RST.9-10.5		1. Utilized PREVIEWED video media websites to show students various methods of AI, including obtaining samples and fertilization.	
D. Animal Health				
1. Identify the importance of animal health in livestock.	RST.9-10.4 RST.9-10.5 SL.9-10.3		1. Show video, <u>Cattlemen Are About Animal Welfare</u> , to students to update them about the care producers take with their animals.	1. Have students research a newly developed product on the market.
2. Describe aspects of the immune system of domestic livestock.	RST.9-10.4 RST.9-10.5 SL.9-10.2		1. Discuss antibiotic resistance with the class, then have the class research antibiotic resistance and how it affects consumer acceptance of agriculture products.	1. Have students present findings in an oral presentation with visual media assistance.
3. Describe the diseases of the respiratory system affecting livestock.	RST.9-10.4 RST.9-10.5 SL.9-10.3		1. Utilize a given chart identifying common herd and flock health problems and diseases to solve a case study scenario.	1. Select and research a current animal health product and create a media sales presentation and present as a representative of the animal health company.
4. Describe the diseases of the gastrointestinal tract in livestock.	RST.9-10.4 RST.9-10.5 SL.9-10.1.d		1. Bring in various products used in treatment of GI diseases. Discuss how they work and how to use them properly.	

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5. Describe the diseases of the reproductive system in livestock.	RST.9-10.4 RST.9-10.5		1. Have students research a given disease and present their findings to the class in the form of an oral and visual media presentation.	
6. Describe the major external and internal parasites of livestock	RST.9-10.4 RST.9-10.5		1. Get examples of feces from various livestock in the area and examine these under a microscope to determine if there are parasites and, if present, what they are.	
7. Describe animal health quality assurance programs.	RST.9-10.4 RST.9-10.5 SL.9-10.1.a SL.9-10.2 SL.9-10.4 SL.9-10.5		1. In groups, have students research the major quality assurance programs in the form of an oral and visual presentation.	1. Select and research a current quality assurance program and create a media sales presentation and present as a representative of the animal health company.

Codes for Common Core Mathematics are:

- N = Number and Quantity
- A = Algebra
- F = Functions
- G = Geometry
- S = Statistics and Probability

Codes for Common Core English Language Arts and Literacy are:

- RL = Reading for Literature
- RI = Reading for Informational Text
- RST = Reading for Literacy in Science and Technical Subjects
- RH = Reading for Literacy in History/Social Studies
- W = Writing
- WHST = Writing for Literacy in History/Social Studies, Science, and Technical Subjects
- SL = Speaking and Listening
- L = Language