

# Agricultural Science I

## 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 Agricultural Science I 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
<b>A. Acquire the skills necessary to positively influence others.</b>		CS.01		
1. Identify FFA, SAE, and classroom instruction as an intracurricular part of the Agricultural Education Program.				
2. Modify their personal plan of study for their Agricultural Education Program including classroom instruction, FFA, and SAE.	WHST.9-10.5		1. Students will develop a career profile.	The career profile will include how classroom instruction, FFA and SAE and how they are incorporated into each other. This plan will be peer edited and revised as needed.
3. Demonstrate knowledge of FFA history and traditions (e.g., mission, vision, etc.).				
4. Identify FFA organization structure and activities.				
5. Demonstrate effective public speaking and communication skills (e.g., recitation of the FFA Creed, Motto, Salute, and/or Mission Statement).	SL.9-10.1		1. Students will develop a word bank of unfamiliar terms based on the FFA Creed, Motto, Salute and/or Mission Statement.	From the terms list students will develop their own written personal understanding of the creed line by line.
6. Demonstrate skills needed for participation in meetings.				

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7. Identify styles and characteristics of effective leadership.				
8. Work productively with a group or independently (e.g., leadership skills, learning styles, etc.).	SL,9-10.1		1. Students will work in groups to develop a debatable agricultural topic that will be presented.	Students will be given to opportunity to debate the topic in an open class forum. Students should be evaluated based on their skills to work as a team.
9. Exhibit good planning skills for a specific task or situation.		CS.01.01.03.a		
10. Set personal goals using the SMART goals method (Specific, Measurable, Approved by you, Realistic, Time-stamped).		CS.01.01.07.a		
11. Use a variety of strategies to evaluate goals (e.g., observe, apply, and demonstrate).		CS.01.01.07.b		
12. Evaluate actions taken and make appropriate modifications to personal goals.		CS.01.01.07.c		
<b>B. Develop a skill set to enhance the positive evolution of the whole person.</b>		<b>CS.02</b>		
1. Identify and explore different types and examples of SAE programs				
2. Plan and implement an SAE program for student's personal plan of study.	WHST.9-10.5		1. Students will develop a career profile.	The career profile will include how classroom instruction, FFA and SAE and how they are incorporated into each other. This plan will be peer edited and revised as needed.
3. Explore various career interests/options.		CS.02.03.01.a		
4. Make decisions to plan for a personal career.		CS.02.03.01.b		
5. Implement a plan to achieve career		CS.02.03.01.c		

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goals and priorities.				
6. Chart the components to creating a balanced work/life plan.	RST.9-10.7	CS.02.03.02.a	1. Students will chart and graph a week's worth of daily activities.	Following charting and graphing students will be required to develop a written plan to adjust their lifestyle to meet their career goals.
7. Balance personal and work responsibilities.		CS.02.03.02.c		
<b>C. Utilize appropriate management planning principles in SAE business enterprises.</b>		<b>ABS.02</b>		
1. Recognize quality SAE business plan components that have been developed using the SMART (specific, measurable, attainable, realistic, and timely) format.	RST.9-10.2	ABS.02.01.01.a.	1. Students will create SMART goals that will help them enhance their SAE aspect of their career profile.	
<b>D. Utilize recordkeeping to accomplish SAE business objectives while complying with laws and regulations.</b>		<b>ABS.03</b>		
1. Fill out receipt and expenditure forms, cash flows, beginning inventory, financial statements, and net worth.	N-Q.2	ABS.03.01.01.a	1. Students will use the Missouri Agricultural Education record book to maintain SAE financial records.	
2. Fill out supplement and leadership pages.	N-Q.2	ABS.03.01.01.a	1. Students will use the Missouri Agricultural Education record book to maintain SAE records.	
<b>E. Apply generally accepted accounting principles and skills to manage cash budgets, credit</b>		<b>ABS.04</b>		

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<b>budgets and credit for SAE businesses.</b>				
1. Budget resources, as applied to the SAE Program, including capital, human, financial, and time.	N-Q.1	ABS.04.01.01.a	1. Student will analyze and evaluate an example SAE for the Missouri Ag. Ed. Record book system.	Develop a working budget for that example.
2. Identify financial concepts associated with production and profit.	N-Q.1 WHST.9-10.9	ABS.04.01.02.a	1. Students will complete and analyze their profit and loss statement of the Missouri Ag. Ed. Record book and will draw conclusions for their SAE.	Make adjustments that need to be made for the upcoming year.
<b>F. Examine the components, historical development, global implications, and future trends of the animal systems industry.</b>		<b>AS.01</b>		
1. Identify the origin, significance, distribution and domestication of animal species.		AS.01.01.01.a		
2. Evaluate and describe characteristics of animals that developed in response to the animals' environment and led to their domestication.	RST.9-10.5	AS.01.01.01.b	1. Students will be assigned a species that they will have to research information on how their environmental requirements have led to its domestication.	Students should have multiple sources information and present this in a visual format.
3. Define major components of the animal industry and their importance.		AS.01.01.02.a		
4. Outline the development of the animal industry and the resulting products, services, and careers.		AS.01.01.02.b		

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5. Describe trends and implications of future development of the animal systems industry.	N-Q.1	AS.01.01.02.c	1. Students will graph trends within a specific animal system industry that has evolved and why they have evolved.	Challenge students to develop multiple types of graphs to display and analyze effectiveness of the different types of graphs.
<b>G. Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.</b>		<b>AS.02</b>		
1. Explain the importance of the binomial system of nomenclature.		AS.02.01.01.a		
2. Identify major animal species by common and scientific names.		AS.02.01.02.a		
3. Compare and contrast the hierarchical classification of the major agricultural animal species.	RST.9-10.9	AS.02.01.02.b	1. Students will research the taxonomic classification of a major agricultural animal species.	Have students create a hierarchical classification chart in comparison with their classmate's species.
4. Appraise and evaluate the economic value of animals for various applications in the agriculture industry.	N-Q.1	AS.02.01.02.c	1. Have student graph the economic commodity value of the major agricultural animal species.	Using data from USDA analytic data determine the economic value per animal and comparison across species.
5. Identify major breeds for each species.				
6. Compare and contrast digestive systems.	RST.9-10.9		1. Students will research and create a visual model of the monogastric and ruminant systems.	The students will compare and contrast the similarities and differences between the systems.
7. Identify ways an animal's health can be affected by anatomical and physiological disorders.		AS.02.03.01.a		
8. Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.	RST.9-10.9	AS.02.03.01.b	1. Students will create educational displays that will identify the anatomical and physiological characteristics of the major	Students then will be required to explain the major differences between the livestock species.

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			livestock species.	
9. Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth, and reproduction.	N-Q.1	AS.02.03.01.c	1. Students will create a chart for animal selection indicating desirable traits for the major livestock species.	Do daily gain and feed efficiency trials on multiple animals and with different selection traits and evaluate and graph results.
<b>H. Provide for the proper health care of animals.</b>		<b>AS.03</b>		
1. Explain methods of determining animal health and disorders.		AS.03.01.01.a		
2. Perform simple health-check evaluations on animals		AS.03.01.01.b		
3. Identify causes, effects, symptoms, and treatments of common diseases, parasites, and physiological disorders that affect animals.		AS.02.01.02.a		
4. Explain the importance of biosecurity to the animal industry.	RI.9-10.8	AS.03.02.01.a	1. Students will research current issues dealing with biosecurity.	Students will create a bibliography validating factual information versus opinion.
<b>I. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.</b>		<b>AS.04</b>		
1. Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.	RST.9-10.9	AS.04.01.01.a	1. Students will research the nutritional roles in which the feedstuffs play.	Students will create a chart comparing the nutritional values of the common types of feedstuffs.
2. Explain the importance of a balanced ration for animals.		AS.04.01.02.a		
3. Demonstrate the procedure for balancing a ration for crude protein.	N-Q.1		1. Students will develop the mathematical procedures to balance a ration for crude protein and will	Have students create their own rations to meet a certain animal species requirements.

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			demonstrate this through example problems.	
4. Explain the purpose and benefits of feed additives and growth promotants in animal production.		AS.04.02.01.a		
5. Discuss how feed additives and growth promotants are administered and the precautions that should be taken.		AS.04.02.01.b		
<b>J. Evaluate and select animals based on scientific principles of animal production.</b>		<b>AS.05</b>		
1. Explain the male and female reproductive organs of the major animal species.		AS.05.01.01.a		
2. Describe the functions of major organs in the male and female reproductive systems.		AS.05.01.01.b		
3. Identify concepts pertaining to conception, gestation, and parturition for different species.				
4. Select breeding animals based on characteristics of the reproductive organs.		AS.05.01.01.c		
5. Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals.		AS.05.02.01.a		
6. Summarize factors that lead to reproductive maturity.	RI.9-10.2	AS.05.02.01.b	1. Students will create a flow chart showing the events leading up to reproductive maturity.	
7. Evaluate and select animals for	N-Q.1	AS.05.02.01.c	1. Students will evaluate	Students will create a scale

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reproductive readiness.			example animals for reproductive readiness.	based system for evaluating desirable reproductive traits.
8. Discuss the importance of efficient and economic reproduction in animals.		AS.05.02.02.a		
9. Evaluate reproductive problems that occur in animals.		AS.05.02.02.b		
10. Create a program designed to identify and treat or cull animals with reproductive problems.		AS.05.02.02.c		
11. Explain genetic inheritance in agricultural animals.	RST.9-10.5	AS.05.03.01.a	1. Utilizing key terms of genetic inheritance students will complete a punnett square.	Students will determine the phenotype and genotype of that animal using the completed punnett square.
12. Explain the advantages of using genetically superior animals in the production of animals and animal products.	RST.9-10.9	AS.05.03.01.b	1. Students will select a genetically superior animal using EPDs.	
13. Select a breeding system based on the principles of genetics.		AS.05.03.01.c		
14. Explain the processes of natural and artificial breeding methods (e.g., estrous synchronization, superovulation, flushing and embryo transfer).	WHST.9-10.2	AS.05.03.02.b	1. Students will research and write a short narrative explaining the historical and scientific advancements of natural and artificial breeding methods.	
15. Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.	N-Q.1 WHST.9-10.2	AS.05.03.03.a	1. Students will select a genetically superior animal using EPDs.	Students will also write a short reasoning why they chose the animal based on set of scenarios.
16. Select animals based on quantitative breeding values for specific characteristics.		AS.05.03.03.c		

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<b>K. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.</b>		<b>AS.06</b>		
1. Discuss the dangers involved in working with animals.	RST.9-10.8	AS.06.01.01.a	1. Students will research and document the number and the extent of animal related injuries.	Researching the advancements made in livestock handling equipment that have prevented the risk of animal related injury.
2. Outline safety procedures for working with animals by species.		AS.06.01.01.b		
3. Explain the implications of animal welfare and animal rights for animal agriculture.	SL.9-10.1	AS.06.01.02.a	1. Students will research animal rights and welfare issues.	The instructor will lead a class debate on the above subject. May have students write editorial in local news media.
4. Identify animal production practices that could pose health risks or are considered to pose risks by some.		AS.06.02.01.a		
5. Discuss consumer concerns with animal production practices relative to human health.	WHST.9-10.7	AS.06.02.01.b	1. Students will create a survey that acquires consumer concerns about production practices relative to human health.	Survey questions will be peer reviewed and edited. Students will graph and analyze collected data.
<b>L. Select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.</b>		<b>AS.07</b>		
1. Identify facilities needed to house and produce an animal species safely and efficiently.		AS.07.01.01.a		
2. Identify equipment and handling facilities used in modern animal production.		AS.07.01.02.a		

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<b>M. Examine components of the food industry and historical development of food products and processing.</b>		FPP.01		
1. Discuss the history and describe and explain the components (e.g., processing, distribution, byproducts) of the food products and processing industry.	RST.9-10.5	FPP.01.01.01.a	1. Students will create a flow chart that will show the inputs and outputs of processing a raw commodity.	
<b>N. Select and process food products for storage, distribution and consumption.</b>		FPP.04		
1. Identify quality and yield grades of food products.	A-CED.1	FPP.04.01.01.a	1. Students will complete calculation to solve yield grades of multiple common livestock species.	
2. Discuss factors that affect quality and yield grades of food products.	RST.9-10.5	FPP.04.01.01.b	1. Students will use the USDA Beef Grading chart to analyze the relationship between age and marbling on quality grade.	
3. Identify and describe accepted animal treatment and harvesting techniques.	WHST.9-10.2	FPP.04.01.03.a	1. Students will write a short narrative on which treatment and harvesting techniques they would use and why?	
4. Identify and evaluate foods derived from animal products.		FPP.04.02.01.a		
<b>O. Plan, build, and maintain agricultural structures.</b>		PST.04		
1. Identify major part of a construction drawing.		PST.04.02.01.a		
2. Identify and interpret different views of a construction drawing.	G-MG.3 RST.9-10.4	PST.04.02.01.b	1. Students will interpret a blue print of an Ag Mech	Create a structural flaw in the blue print and have student

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			project. Creating a cut list, projected cost.	identify it and create solution to fix flaw.
3. Develop skills for working with wood and/or metal.	G-MG.3 RST.9-10.3		1. Students will create/build a project.	Students will develop a bill of materials based on the project they had built.
4. Paint or protect with coatings.		PST.04.04.03.b		
5. Identify kinds and characteristics of wood and/or metal materials.				
6. Distinguish welding processes, positions, and materials preparation.	RST.9-10.5			
7. Identify common woodworking and/or metal working tools.				

**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