Advanced Crop Science

Instructional Framework

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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 Advanced Crop 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. Overview				
Missouri Crops and Their Uses	R1.11-12.1 RST.11-12.7 RST.11-12.8 RST.11-12.9 SL.11-12.4 SL.11-12.6 WHST.11-12.1.a-b WHST.11-12.1.e SL.11-12.4 SL.11-12.6		 Research the different crops grown in Missouri and present them orally to the class. Challenge students to develop a new food product from the crops grown in Missouri and create a poster 	
	RST.11-12.4		presentation. 3. Create flash cards of the different crops grown in Missouri.	
2. The Importance of Crops	S-ID.1		Research and conduct a scavenger hunt for current events and create a graph of comparing numbers of	

		bushels of crops
		grown in Missouri.
3. Careers in Crop Science	SL.11-12.6	1. Interview an
3. Curcers in Crop Science	RI.11-12.7	individual in the crop
	RST.11-12.7	science industry.
	RST.11-12.7 RST.11-12.8	2. Research a career in
	RST.11-12.9	the crop science
	WHST.11-12.4	industry.
	WHST.11-12.4 WHST.11-12.7	masa y.
	WHST.11-12.7 WHST.11-12.9	
4. Government Influence and	RST.11-12.1	1. Complete a case study
Current Trends	WHST.11-12.1.a-e	covering the
Current Hends	WHST.11-12.1.a-e WHST.11-12.9	governmental
	W1131.11-12.9	influence on the crop
		science industry.
		l
		2. Complete a case study
		covering the current
		trends in the crop
D. Dlant Dialogy		science industry.
B. Plant Biology		
1. Plant Physiology	WHST.11-12.10	1. Germinate seeds of
	RI.11-12.7	monocot and dicot plants.
	RST.11-12.7	Record daily observations
	RST.11-12.8	in a journal.
	RST.11-12.9	2. Plant different varieties
	WHST.11-12.4	of seeds within a species
	WHST.11-12.7	and complete a research
	WHST.11-12.9	report with your findings.
2. Plant Growth and Nutrient	RST.11-12.1	1. Complete a case study
Needs	WHST.11-12.1.a-e	on recent findings in
	WHST.11-12.9	regards to nutrients
	SL.11-12.4	valuable for plant growth.
	SL.11-12.6	2. Interview a soil

	WHST.11-12.2.a-b	scientist. Present your
	WHST.11-12.2.e	findings to the class.
C. Soil Fertility and	W1151.11-12.2.C	initings to the class.
Management		
	SL.11-12.2	1. Provide four soil
1. Soil Composition	1 - 1	
	SL.11-12.6	samples for the
		students to judge. Have
		them analyze the soil
		particles of each
		sample.
2. Soil Types and	WHST.11-12.1.a-e	1. Have the students use
Limitations	WHST.11-12.2.a-e	soil sample books to
	WHST.11-12.7	determine the soil in a
	SL.11-12.6	particular area. Have
		them prepare written
		reasons why they feel
		the selected area would
		have good or poorly
		draining soils.
		2. Have students interview
		a land owner which has
		recently completed
		conservation practices
		on their land.
3. Soil Testing	SL.11-12.2	1. Organize a soils
	SL.11-12.6	judging career
	RI.11-12.7	development event
	RST.11-12.7	team with students in
	RST.11-12.8	the class.
	RST.11-12.9	2. Have students complete
	WHST.11-12.4	a research report which
	WHST.11-12.7	is analyzing results
	WHST.11-12.9	from soil sampling.

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4. Fertilizing Soils	SL.11-12.5	1. Create a media
	SL.11-12.6	presentation explaining
	WHST.11-12.2.a-b	fertilizer application
	WHST.11-12.2.e	methods.
	N-Q.1	2. Calculate fertilizer
		needs and application
		rates of selected fields.
5. Soil Management	SL.11-12.4	1. Prepare a poster
Practices	SL.11-12.6	presentation explaining
	SL.11-12.1.c-d	the different tillage
	SL.11-12.6	practices.
		2. Prepare a poster
		presentation explaining
		the different planting
		methods.
		3. Conduct a debate on
		conventional- versus
		conservation-tilled
		soils.
6. Soil Conservation	SL.11-12.6	1. Have students conduct
Practices	RST.11-12.1	interviews with
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	WHST.11-12.11.a-e	individuals who
	WHST.11-12.9	practice soil
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	conservation.
		2. Analyze case studies
		over the different soil
		conservation practices.
D. Identifying and Selecting		Conservation practices.
Crops and Seeds		
Crop and Weed	SL.11-12.4	1. Create a poster
Identification	SL.11-12.6	presentation over
	RI.11-12.7	legumes, forbs, or
	RST.11-12.7	woody plants.

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	RST.11-12.8	2. Prepare a research
	RST.11-12.9	report over the weeds
	WHST.11-12.4	in their area.
	WHST.11-12.7	
	WHST.11-12.9	
2. Crop Selection	SL.11-12.4	1. Conduct an interview
	SL.11-12.6	with a seed salesperson
	WHST.11-12.2.a-b	and prepare a
	WHST.11-12.2.e	presentation for the
		class.
3. Crop Seed Selection	WHST.11-12.1.a-e	1. Have students research
_	WHST.11-12.2.a-e	various seed companies
	WHST.11-12.7	and prepare written
	SL.11-12.2	reasons for seed
	SL.11-12.6	selected.
	SE.11 12.0	2. Develop seed judging
		activities for the
F Cafata Faciliana and and		students.
E. Safety, Environment, and		
Legal Issues		
 Protecting Ourselves and 	WHST.11-12.6	1. Have students create an
Others	SL.11-12.4	online social media
	SL.11-12.6	presentation about
		safety around the farm.
		2. Create a poster about
		safety and present to an
		elementary class.
2. Protecting the	SL.11-12.1.c-d	1. Conduct a debate on the
environment	SL.11-12.6	biggest problem or
	RI.11-12.7	danger of crop
	RST.11-12.7	production activities.
	RST.11-12.8	2. Have students research
	RST.11-12.9	the different
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WHST.11-12.4 WHST.11-12.7 WHST.11-12.7 WHST.11-12.9 WHST.11-12.9 Natural Resource and Conservation Services. 3. Knowing the law N-Q.1 1. Calculate legal land descriptions. F. Corn and Grain Sorghum	
WHST.11-12.9 Natural Resource and Conservation Services. 3. Knowing the law N-Q.1 1. Calculate legal land descriptions. F. Corn and Grain Sorghum	
3. Knowing the law N-Q.1 1. Calculate legal land descriptions. F. Corn and Grain Sorghum Conservation Services. 1. Calculate legal land descriptions.	
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F. Corn and Grain Sorghum descriptions.	
F. Corn and Grain Sorghum	ļ
Production	
1. Planning the Crop RST.11-12.4 1. Create flash cards of	
RI.11-12.7 nutrient deficiencies.	
RST.11-12.7 2. Conduct an experiment	
RST.11-12.8 and write a research	
RST.11-12.9 report on the effects of	
WHST.11-12.4 light or temperature on	
WHST.11-12.7 plants.	
WHST.11-12.9	
2. Selecting a Variety RST.11-12.4 1. Create flash cards of	
nutrient deficiencies.	
3. Selecting a Tillage and SL.11-12.1.c-d 1. Conduct a debate on the	
Planting Method SL.11-12.6 different tillage wHST.11-12.6 methods.	
N-Q.1 2. Create an online	
database for the state to	
compare planting and	
harvest dates.	
3. Calculate corn	
populations and costs	
of planting.	
4. Selecting a Pest Control RST.11-12.4 1. Create flash cards of	
Program SL.11-12.6 common pests.	
2. Interview crop scouts	
on common pests in the	
area.	

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5. Scouting and Maintaining	RST.11-12.4	1. Create flash cards of
the Crops	SL.11-12.6	common weeds.
	N-Q.1	2. Interview crop scouts
		on common pests in the
		area.
		3. Calculate the costs of
		replanting lost crops.
6. Harvesting the Crop	N-Q.1	1. Calculate the proper
	SL.11-12.5	harvest times.
	SL.11-12.6	2. Calculate harvest
	WHST.11-12.2.a-b	losses.
	WHST.11-12.2.e	3. Create a media
		presentation of the
		different harvest
		methods.
7. Marketing the Crop	N-Q.1	1. Using a specified
, maniering the crop	WHST.11-12.10	commodity play the
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	futures market.
		2. Set up an imaginary
		farm and fill out a
		journal along the way.
8. Figuring Crop Costs	N-Q.1	1. Calculate variable and
8. Figuring Crop Costs	11-Q.1	fixed costs and net
G. Soybean Production		returns.
1. Planning the Crop	RST.11-12.4	1. Create flash cards of
	RI.11-12.7	nutrient deficiencies.
	RST.11-12.7	2. Conduct an experiment
	RST.11-12.8	and write a research
	RST.11-12.9	report on the effects of
	WHST.11-12.4	light or temperature on
	WHST.11-12.7	plants.
	WHST.11-12.9	

2.	Selecting a Variety	RST.11-12.4	1. Create flash cards of nutrient deficiencies.
2	Caladina Tillara and	CI 11 12 1 - 1	
3.	Selecting a Tillage and	SL.11-12.1.c-d	1. Conduct a debate on the
	Planting Method	SL.11-12.6	different tillage
		WHST.11-12.6	methods.
		N-Q.1	2. Create an online
			database for the state to
			compare planting and
			harvest dates.
			3. Calculate corn
			populations and costs
			of planting.
4.	Selecting a Weed Control	RST.11-12.4	1. Create flash cards of
	Program	SL.11-12.6	common weeds.
	_		2. Interview crop scouts
			on common pests in the
			area.
5.	Scouting and Maintaining	RST.11-12.4	1. Create flash cards of
	the Crops	SL.11-12.6	common weeds.
	-	N-Q.1	2. Interview crop scouts
		-	on common pests in the
			area.
			3. Calculate the costs of
			replanting lost crops.
6.	Harvesting the Crop	N-Q.1	1. Calculate the proper
		SL.11-12.5	harvest times.
		SL.11-12.6	2. Calculate harvest
		WHST.11-12.2.a-b	losses.
		WHST.11-12.2.e	3. Create a media
			presentation of the
			different harvest
			methods.
7.	Marketing the Crop	N-Q.1	1. Using a specified

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	WHST.11-12.10	aamma dityy playy tha
	W IIS 1.11-12.10	commodity play the futures market.
		2. Set up an imaginary
		farm and fill out a
	77.0.1	journal along the way.
8. Figuring Crop Costs	N-Q.1	1. Calculate variable and
		fixed costs and net
		returns.
H. Wheat and Small Grain		
Production		
 Planning the Crop 	RST.11-12.4	1. Create flash cards of
	RI.11-12.7	nutrient deficiencies.
	RST.11-12.7	2. Conduct an experiment
	RST.11-12.8	and write a research
	RST.11-12.9	report on the effects of
	WHST.11-12.4	light or temperature on
	WHST.11-12.7	plants.
	WHST.11-12.9	
2. Selection of Variety	RST.11-12.4	1. Create flash cards of
•		nutrient deficiencies.
3. Selecting a Tillage and	SL.11-12.1.c-d	1. Conduct a debate on the
Planting Method	SL.11-12.6	different tillage
	WHST.11-12.6	methods.
	N-Q.1	2. Create an online
		database for the state to
		compare planting and
		harvest dates.
		3. Calculate corn
		populations and costs
		of planting.
4. Pest Control Program	RST.11-12.4	1. Create flash cards of
1 000 001110811110	SL.11-12.6	common pests.
	52.11 12.0	2. Interview crop scouts
		2. Interview crop scouts

		on common pests in the
		area.
5. Scouting and Maintaining	RST.11-12.4	1. Create flash cards of
the Crop	SL.11-12.6	common weeds.
une crop	N-Q.1	2. Interview crop scouts
	11 Q.1	on common pests in the
		area.
		3. Calculate the costs of
		replanting lost crops.
6. Harvesting the Crop	N-Q.1	1. Calculate the proper
o. Traivesting the Crop	SL.11-12.5	harvest times.
	SL.11-12.5 SL.11-12.6	2. Calculate harvest
	WHST.11-12.2.a-b	losses.
	WHST.11-12.2.e	3. Create a media
	WHS1.11-12.2.E	
		presentation of the
7 Madada dha Carr	N O 1	different harvest methods.
7. Marketing the Crop	N-Q.1	1. Using a specified
	WHST.11-12.10	commodity play the
		futures market.
		2. Set up an imaginary
		farm and fill out a
	27.0.1	journal along the way.
8. Figuring Crop Costs	N-Q.1	1. Calculate variable and
		fixed costs and net
		returns.
I. Forage Production		
 Planning the Crop 	RST.11-12.1	1. Complete a case study
	WHST.11-12.a-e	covering forage
	WHST.11-12.9	production.
	SL.11-12.6	2. Interview a local
		producer.
2. Selecting a Forage	RST.11-12.4	1. Create flash cards of the
	RI.11-12.7	different types of

	RST.11-12.7	forages.
	RST.11-12.7 RST.11-12.8	2. Research and report on
	RST.11-12.8 RST.11-12.9	
	SL.11-12.4	forage grown in the
	~	area.
	SL.11-12.6	
	WHST.11-12.1.a-b	
	WHST.11-12.1.e	
3. Selecting a Tillage and	RI.11-12.7	1. Research the different
Planting Method	RST.11-12.7	types of equipment to
	RST.11-12.8	plant a forage stand.
	RST.11-12.9	2. Examine soil sample of
	WHST.11-12.4	well and non-well
	WHST.11-12.7	established forage
	WHST.11-12.9	stands.
	SL.11-12.2	
	SL.11-12.6	
4. Scouting and Maintaining	RST.11-12.4	1. Create flash cards of the
the Crop	SL.11-12.5	different types of pests.
_	SL.11-12.6	2. Create a PowerPoint
	WHST.11-12.2.a-b	presentation of the
	WHST.11-12.2.e	different methods to
		control pests.
5. Selecting a Grazing	WHST.11-12.1.a-e	1. Provide written reasons
System	WHST.11-12.2.a-e	why you would choose
	WHST.11-12.7	the different grazing
	N-Q.1	systems.
		2. Practice calculating
		Carrying capacity and
		"cow-days."
6. Harvesting for Seed	SL.11-12.4	1. Create a poster of five
o. Harvesting for Seed	SL.11-12.4 SL.11-12.6	different forage crops
	SL.11-12.0	used for their seeds and
		present to the class.

7. Harvesting for Feed	WHST.11-12.10	1. Record in a journal the analysis of several hay samples.
8. Marketing the Crop and Figuring Crop Costs	N-Q.1	1. Calculate crop costs.
J. Cotton Production		
1. Planning the Crop	N.Q-1 WHST.11-12.1.a-e WHST.11-12.2.a-e WHST.11-12.7	Calculate and chart rain fall over a period of time. Conduct and analyze soil samples. Provide written results.
2. Selecting the Variety	SL.11-12.4 SL.11-12.6 WHST.11-12.2.a-b WHST.11-12.2.e	1. Have students research various seed companies and prepare written reasons. 2. Develop seed judging activities for the students.
3. Tilling and Planting the Crop	SL.11-12.1.c-d SL.11-12.6 WHST.11-12.6	1. Conduct a debate on the different tillage methods. 2. Create an online database for the state to compare planting and harvest dates.
4. Selecting a Weed Control Program	RST.11-12.4 SL.11-12.6	Create flash cards of common weeds. Interview crop scouts on common pests in the area.

5. Scouting and Maintaining	RST.11-12.4	1. Create flash cards of the
the Crop	SL.11-12.5	different types of pests.
	SL.11-12.6	2. Create a PowerPoint
	WHST.11-12.2.a-b	presentation of the
	WHST.11-12.2.e	different methods to
		control pests.
6. Harvesting the Crop	N-Q.1	1. Calculate the proper
	SL.11-12.5	harvest times.
	SL.11-12.6	2. Calculate harvest
	WHST.11-12.2.a-b	losses.
	WHST.11-12.2.e	3. Create a media
		presentation of the
		different harvest
		methods.
7. Marketing the Crop	N-Q.1	1. Using a specified
	WHST.11-12.10	commodity play the
		futures market.
		2. Set up an imaginary
		farm and fill out a
		journal along the way
8. Figuring Crop Costs	N-Q.1	1. Calculate variable and
		fixed costs and net
		returns.
K. Rice Production		
1. Planning the Crop	N.Q-1	1. Calculate and chart rain
	WHST.11-12.1.a-e	fall over a period of
	WHST.11-12.2.a-e	time.
	WHST.11-12.7	2. Conduct and analyze
		soil samples. Provide
		written results.
2. Selecting a Variety	SL.11-12.4	1. Have students research
	SL.11-12.6	various seed companies

	WHST.11-12.2.a-b	and prepare written
	WHST.11-12.2.e	reasons.
	.,	2. Develop seed judging
		activities for the
		students.
3. Tilling and Planting the	SL.11-12.1.c-d	1. Conduct a debate on the
Crop	SL.11-12.6	different tillage
Стор	WHST.11-12.6	methods.
	VVIIS1.11 12.0	2. Create an online
		database for the state to
		compare planting and
		harvest dates.
4. Scouting and Maintaining	RST.11-12.4	1. Create flash cards of the
the Crop	SL.11-12.5	different types of pests.
the Crop	SL.11-12.5 SL.11-12.6	2. Create a PowerPoint
	WHST.11-12.2.a-b	
	WHST.11-12.2.a-0 WHST.11-12.2.e	presentation of the different methods to
	WHS1.11-12.2.E	
5 Hammarking the Court	N.O.1	control pests.
5. Harvesting the Crop	N-Q.1	1. Calculate the proper
	SL.11-12.5	harvest times.
	SL.11-12.6	2. Calculate harvest
	WHST.11-12.2.a-b	losses.
	WHST.11-12.2.e	3. Create a media
		presentation of the
		different harvest
		methods.
6. Marketing the Crop	N-Q.1	1. Calculate variable and
		fixed costs and net
		returns.

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