

Agricultural Machinery

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 Machinery 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	Enhancement
A. Following Safety Procedures				
1. Demonstrate safe machinery operation practices	SL.11-12.5		1. Students create poster and commercial about safety procedures to be used around machinery. Students must use a variety of resources.	1. Students make use of digital media in a presentation to enhance understandings of findings, reasoning, and evidence on why safety around machinery is important.
2. Demonstrate safe procedures for servicing, repairing, calibrating and adjusting agricultural machinery				
B. Operating and Maintaining Power Units				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
2. Size and select unit	RI.11-12.7			1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel plow vs. disk).
3. Service and repair unit	W.11-12.7			1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust unit				
5. Check and service charging and starting systems				
6. Check and service comfort systems				
7. Check and service hydraulic systems				
8. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of preparing machinery for post-season storage.
9. List steps to follow after removing machinery from post season storage				
10. Explain principles of hitching and ballasting				

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
C. Operating and Maintaining Primary Tillage Equipment				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			<ol style="list-style-type: none"> 1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.
2. Size and select equipment	RI.11-12.7			<ol style="list-style-type: none"> 1. Students will evaluate the advantages and disadvantages of using different equipment for different situations.
3. Service and repair equipment	W.11-12.7			<ol style="list-style-type: none"> 1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust equipment				
5. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			<ol style="list-style-type: none"> 1. Students write an imagined narrative on the experience of preparing machinery for post-season storage.
6. List steps to follow after removing machinery from	W.11-12.3a W.11-12.3d			<ol style="list-style-type: none"> 1. Students write an imagined narrative on the experience of

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
post season storage	W.11-12.3e			removing machinery from post-season storage.
7. Explain principles of hitching and ballasting				
D. Operating and Maintaining Secondary Tillage Equipment				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			<ol style="list-style-type: none"> 1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.
2. Size and select equipment	RI.11-12.7			<ol style="list-style-type: none"> 1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel plow vs. disk).
3. Service and repair equipment	W.11-12.7			<ol style="list-style-type: none"> 1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust equipment				
5. List steps to prepare	W.11-12.3a			<ol style="list-style-type: none"> 1. Students write an imagined

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
machinery for post season storage	W.11-12.3d W.11-12.3e			narrative on the experience of preparing machinery for post-season storage.
6. List steps to follow after removing machinery from post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of removing machinery from post-season storage.
7. Explain principles of hitching and ballasting				
E. Operating and Maintaining Planting Equipment				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.
2. Size and select equipment	RI.11-12.7			1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel plow vs. disk).
3. Service and repair equipment	W.11-12.7			1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
				narrow their research to the source of the problem.
4. Calibrate and adjust equipment				
5. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of preparing machinery for post season storage.
6. List steps to follow after removing machinery from post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of removing machinery from post-season storage.
7. Explain principles of hitching and ballasting				
F. Operating and Maintaining Chemical Applicators				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.
2. Size and select applicator	RI.11-12.7			1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel

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				plow vs. disk).
3. Service and repair applicator	W.11-12.7			1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust applicator				
5. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of preparing machinery for post season storage.
6. List steps to follow after removing machinery from post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of removing machinery from post season storage.
7. Explain principles of hitching and ballasting				
G. Operating and Maintaining Harvesting Equipment				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
				troubleshooting equipment.
2. Size and select equipment	RI.11-12.7			1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel plow vs. disk).
3. Service and repair equipment	W.11-12.7			1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust equipment				
5. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of preparing machinery for post-season storage.
6. List steps to follow after removing machinery from post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of removing machinery from post-season storage.
7. Explain principles of hitching and ballasting				
H. Operating and Maintaining Materials and Handling Equipment				
1. Demonstrate the uses of machinery operator manuals	RST.11-12.4 RST.11-12.9			1. Students will demonstrate the meaning of symbols, key terms, and domain specific terms as

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
				they are used in the operator's manual. 2. Students will gather information from the operator's manual to understand the process of troubleshooting equipment.
2. Size and select equipment	RI.11-12.7			1. Students will evaluate the advantages and disadvantages of using different equipment for different situations (i.e. chisel plow vs. disk).
3. Service and repair equipment	W.11-12.7			1. Students will construct a short problem to solve and possible questions to research (i.e. what is wrong and why). They will narrow their research to the source of the problem.
4. Calibrate and adjust equipment				
5. List steps to prepare machinery for post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of preparing machinery for post-season storage.
6. List steps to follow after removing machinery from post season storage	W.11-12.3a W.11-12.3d W.11-12.3e			1. Students write an imagined narrative on the experience of removing machinery from post-season storage.
7. Explain principles of hitching and ballasting				
I. Leadership and Personal				

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
Development for Advanced Students				
1. Develop a resume and complete a job application	L.11-12.1 L.11-12.2 W.11-12.10		1. Develop a Resume 2. Complete Sample Job Application	
2. Develop a plan for finding a job	W.11-12.4		1. Take a Career Interest Survey 2. Write a cover letter	
3. Describe how to apply and interview for a job	SL.11-12.6		1. Conduct Sample Job Interviews	
4. Describe the characteristics needed to develop desirable personal and social skills	SL.11-12.1		1. Verbal and Nonverbal Communication 2. Role Playing	
5. Describe the importance and process of developing better human relationships	SL.11-12.1		1. Role Playing 2. Group Discussion	
UNIT: Explore a career area by investigating entry-level job opportunities at a local agricultural business and writing a résumé and letter of application for a position.				
J. Using the <i>Missouri Agricultural Record Book for Secondary Students</i>				
1. Complete forms needed to open the Missouri Agricultural Record Book			1. Form 100/101 (SAE Enterprises /Agreement)	

	Common Core Standards	National Standards (AFNR)	Activities	Enhancement
for Secondary Students				
2. Complete a budget for the SAE program	N-Q.1		1. Complete Form 103 (Budget)	
3. Complete inventory and financial statement forms for the Missouri Agricultural Record Book for Secondary Students	N-Q.1		1. Complete Forms 6, 7, 8, 9, 10, 11, 12 (Financials)	
4. Complete receipt and expenditure forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1		1. Forms 1, 2, 3, 4, 5	
5. Complete additional forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1		1. Supplemental (102, 104, 105, 106, 107) 2. Leadership Pages (108, 109, 110, 111) 3. Directed Lab 4. Community Service Hours Log	
UNIT: Demonstrate the ability to use selected forms in the <i>Missouri Agricultural Record Book for Secondary Students</i> by using a list of sample entries to complete the applicable forms in the book.				

Competency Criteria:

1. Demonstrate safety
2. Size and Select Equipment
3. Service and Repair Equipment
4. Calibrate and Adjust Equipment
5. List steps prepare postseason
6. List steps prepare preseason
7. Explain procedures of hitching

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