

Forestry

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 Forestry 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	Activities (already in the Curriculum)	National Standards (AFNR)	Enhancements (if done, would add an additional standard)
A. Professional Forestry Careers				
1. Professional Forestry Careers	RST.11-12.4 RST.11-12.9	Activities in <ul style="list-style-type: none"> • Research forestry related careers • Analyze the sacrifices and satisfaction with conservation careers. 		<ol style="list-style-type: none"> 1. Participate in the Forestry CDE/TSA RST.11-12.4, RST.11-12.9, G-MG.1, G-MG.2, G-MG.3, G-GMD.1, N-Q.1, N-Q.2 2. Complete a Forestry Proficiency Application WHST.11-12.2 3. Attend a MDC Conservation Honors Program or GLADE program 4. Write universities seeking information on their undergraduate programs in conservation related fields. Then compare based on expenses, curriculum, location, percentage of graduates finding work, etc. WHST.11-12.2, RST.11-12.9

	Common Core Standards	Activities (already in the Curriculum)	National Standards (AFNR)	Enhancements (if done, would add an additional standard)
2. Technical Forestry Careers	RST.11-12.4 RST.11-12.9	Activities in <ul style="list-style-type: none"> • Research forestry related careers • Analyze the sacrifices and satisfaction with conservation careers. 	Math Modeling	<ol style="list-style-type: none"> 1. Participate in the Forestry CDE/TSA RST.11-12.4, RST.11-12.9, G-MG.1, G-MG.2, G-MG.3, G-GMD.1, N-Q.1, N-Q.2 2. Develop SAE working in a conservation field 3. Write universities seeking information on their undergraduate programs in conservation related fields. Then compare based on expenses, curriculum, location, percentage of graduates finding work, etc. WHST.11-12.2, RST.11-12.9
B. Forest Plant Identification				
1. Tree Identification	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Learning parts of a tree to be able to identify 		<ol style="list-style-type: none"> 1. Collection of pressed leaves, twigs, bark, fruit and flowers
2. Introduction to Plant Keying	S-IC.1 RST.11-12.4	Activities in <ul style="list-style-type: none"> • Estimating total number of plants they can recognize • Plant Classification system 		
3. Silvics	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Understanding different habitats for trees species 		<ol style="list-style-type: none"> 1. Write a detailed report on the silvical characteristics of an individual tree species WHST.11-12.2 2. Visit a wooded area to observe the different characteristics. Journal about the observations. WHST.11-12.10

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4. Tree Uses				3. Collect articles on the greenhouse effect and other issues effecting forest. Give an oral or written report. WHST.11-12.2, SL.11-12 4. Collect and sell black walnuts. N-Q.1
5. Missouri Forest Types	RST.11-12.9	Activities in <ul style="list-style-type: none"> • Compare and Contrast bottomland and understory trees. (Northern, Upland Central, and Southern Hardwoods) 		
C. Forest Measurement				
1. Aerial Photographs and Topographic Maps	RST.11-12.4 N-Q.1 N-Q.2	Activities in <ul style="list-style-type: none"> • Reading an aerial map and making the conversation of the scale. • Reading a topographic map and the common scale used. • Converting square inches to acres • Determining elevation 		
2. Legal Land Descriptions	RST.11-12.4 N-Q.1	Activities in <ul style="list-style-type: none"> • Determining legal land descriptions • Reading a county plat book • Locating property based on a legal land description • Determine number of acres in a given area 		

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3. Chaining, Pacing, and Using a Hand Compass	RST.11-12.4 N-Q.1 N-CN.6 G-CO.1	Activities in <ul style="list-style-type: none"> Measuring Horizontal distance Reading a compass Using a GPS to plot coordinates Operating and transit to set coordinates and check heights. 		1. Establish their pace distance by walking off a 100' distance, then measure to determine their accuracy. Practice again with 200' and 300'. N-Q.2, N-CN.6, G-CO.1
1. Tree Measurement	RST.11-12.4 G-MG.1 G-MG.2 G-MG.3 G-GMD.1	Activities in <ul style="list-style-type: none"> Determining breast height and merchantable height of trees with diameter tape, tree calipers, and Biltmore sticks, Determining diameter at breast height and merchantable height estimated with a cruising stick Estimating the basal area 		
2. Site Index	RST.11-12.4 G-MG.1 G-MG.2 G-MG.3 G-GMD.1	Activities in <ul style="list-style-type: none"> Estimate and apply the site index Determine the average height of a tree Determine the age of the trees in your sample Plot your average height and age of the sample trees in the site index curve. 		

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3. Stand Density and Stocking Level	RST.11-12.4 G-MG.1 G-MG.2 G-MG.3 G-GMD.1	Activities in <ul style="list-style-type: none"> • Stand density • Timber Stand • Stocking Level • Using a Stocking Chart 		
4. Tree Volume Calculations	RST.11-12.4 G-MG.1 G-MG.2 G-MG.3	Activities in <ul style="list-style-type: none"> • Determining Tree Volume • Using a Tree Volume Table • Using a Tally Sheet and making the calculations • Calculating total board feet volume 		
5. Log Grading	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Identifying tree defects • Identifying the different log use classes 		
D. Silvicultural Practices				
1. Tree Selection	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Determining the soil characteristics • Defining aspect • Describing how aspect affects trees • Considering disease susceptibility • Identifying markets during tree species selection process 		

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2. Site Preparation	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Determining site preparation, mechanical site preparation, • Using herbicides • How to conduct a prescribed burn 		
3. Forest Tree Planting	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Identifying Reforestation • Analyzing direct seeding and planting tree seedlings • Purchasing and storing tree seedlings • Planting Methods of trees 		1. Plant a tree. RST.11-12.3
2. Windbreaks	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Analyzing windbreaks • Location of windbreaks • Spacing requirements of windbreaks • Common trees / shrubs used in windbreaks • Identifying the types of planting stock • Managing windbreaks • Designing a windbreak 		1. Work with a local organization and plant a windbreak at a local park.

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3. Natural Regeneration	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Identifying natural regeneration • Sources of forest reproduction • Silvicultural systems affecting natural regeneration • Inventorying different types of woodland/forested areas 		
4. Intermediate Cuttings	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Identifying the purpose of intermediate cuttings • Determining cull trees • Types of intermediate cuttings • Deadening trees 		
5. Forest Tree Pruning	RST.11-12.4	Activities in <ul style="list-style-type: none"> • Importance of pruning trees • Proper pruning techniques • Identifying and using pruning tools 		1. Prune trees either around school or at another location to allow students that opportunity for practice.

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2. Chainsaw Pruning	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Identifying proper safety equipment • Preventative maintenance • Starting and refueling a chainsaw • Transporting and storage • Sharpening blade • Adjusting blade tension 		1. Provide students with the opportunity to operate a chainsaw
E. Forest Resource Protection				
1. Forested Watersheds	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Determining what is a watershed • Protection of watersheds • Using Forested stream corridors • Analyzing leaf litter 		
2. Forest Fires	RST.11-12.5	Activities in <ul style="list-style-type: none"> • Identifying causes of forest fires • Analyzing effects of forest fires • Jobs in fire suppression • Identifying fire behavior • Fighting forest fires 		

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3. Forest Insect and Diseases	RST.11-12.4 RST.11-12.9	Activities in <ul style="list-style-type: none"> Identifying common forest insects and their damage Identifying common forest diseases and their damage Control methods for diseases and insects Comparing different samples of insect/disease damage 		1. Collect leaf, bark, and wood with insect and diseases to compare and for students to further identify. RST.11-12.9
2. Forest Management and Wildlife	RST.11-12.5	Activities in <ul style="list-style-type: none"> Understanding Livestock's effect on forest and wildlife habitat Planning TSI to improve wildlife habitat Using snag and den trees Impact of timber harvesting 		
3. Effects of Forest Recreation	RST.11-12.5	Activities in <ul style="list-style-type: none"> Identifying recreational activities Planning forest recreation Minimizing forest damages by recreation 		1. Participate in Forest Recreation Activities
F. Forest Management Plan				

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1. Forestry Assistance	RST.11-12.5	Activities in <ul style="list-style-type: none"> Identifying forestry assistance, if available, from government agencies, private consultants, nonprofit associations, Using programs of the MDC 		
2. Forest Management Plan	RST.11-12.4 RST.11-12.9 G-MG.1 G-MG.2 G-MG.3 G-GMD.1	Activities in <ul style="list-style-type: none"> Developing a forest management plan 		
G. Leadership and Personal 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	<ul style="list-style-type: none"> Develop a Resume Complete Sample Job Application 		
2. Develop a plan for finding a job	W.11-12.4	<ul style="list-style-type: none"> Take a Career Interest Survey Write a cover letter 		
3. Describe how to apply and interview for a job	SL.11-12.6	<ul style="list-style-type: none"> Conduct Sample Job Interviews 		
4. Describe the characteristics needed to develop desirable personal and social skills	SL.11-12.1	<ul style="list-style-type: none"> Verbal and Nonverbal Communication Role Playing 		
5. Describe the importance and process of developing better human relationships	SL.11-12.1	<ul style="list-style-type: none"> Role Playing Group Discussion 		1. Community Service Project

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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.				
H. Using the <i>Missouri Agricultural Record Book for Secondary Students</i>				
1. Complete forms needed to open the Missouri Agricultural Record Book for Secondary Students		Form 100/101 (SAE Enterprises/Agreement)		
2. Complete a budget for the SAE program	N-Q.1	Complete Form 103 (Budget)		
3. Complete inventory and financial statement forms for the Missouri Agricultural Record Book for Secondary Students	N-Q.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	Forms 1, 2, 3, 4, 5 (Income, Expenses, Cash Flow)		
5. Complete additional forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1	Supplemental (102, 104, 105, 106, 107) Leadership Pages (108, 109, 110, 111) Directed Lab Community Service Hours Log		

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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.				

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