

# **Landscaping and Turf Management**

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## **Instructional Framework**

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

	<b>Common Core Standards</b>	<b>National Standards (AFNR)</b>	<b>Activities</b>	<b>Enhancements</b>
<b>A. Evaluating Opportunities in the Landscaping and Turf grass Industries</b>				
1. Explain the importance of landscaping and turf grass industries today and in the future	S-ID.1		1. Research and do a scavenger hunt for current topics and distribution of the landscaping and turf grass industries in Missouri and create a graph comparing the distribution and sectors of the industry.	1. WHST.11-12.5-Have students turn in a rough draft copy of their paper for evaluation of grammar and spelling and return to them after grading for revision. 2. WHST.11-12.8-Make sure to talk about validity of research and sources, reliable source information, strengths and limitations of sources, and avoiding plagiarism.
2. Identify and describe landscape and turf grass jobs	RI.11-12.7 RST.11-12.7 RST.11-12.8 RST.11-12.9 WHST.11-12.4 WHST.11-12.7 WHST.11-12.9		1. Have students choose a career in the landscape or turf grass industry and utilize multiple sources to develop a research paper outlining their chosen career. Students will also need to utilize their creative writing skills to develop a story about a day in the life of their chosen career area.	
<b>B. How Plants Grow</b>				
1. Label plant parts and structures correctly and	SL.11-12.4 SL.11-12.6		1. Break students into small groups to create a poster	

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identify the differing growth patterns of monocot and dicot plants	G-MG.3		illustrating the complete structure of a monocot or dicot plant (drawn to scale) with all parts correctly labeled and present the information to the class.	
2. Demonstrate knowledge of soil properties and how soil quality relates to plant growth; assess the soil at a planting site and determine how to improve it, if needed	N-Q.2 N-Q.3		1. After taking a soil sample and having it analyzed, develop a case study and have students select and calculate the prices for components needed to adjust soil levels. Students need to make sure to select appropriate quantities and choose an appropriate level of accuracy for limitations.	1. N-Q.1-Present the price findings as a client proposal in graph or data display form.
3. Describe environmental factors that should be considered before selecting a plant for the landscape	RST.11-12.1 WHST.11-12.1.a WHST.11-12.1.b WHST.11-12.1.c WHST.11-12.1.d WHST.11-12.1.e WHST.11.12.9		1. Given a set of environmental factors/parameters for a case study, students need to utilize a hardiness zone map and select a series of plants for a given landscape/area based upon the environmental factors.	
<b>C. Identification</b>				
1. Identify the basic structural features of trees and shrubs	RST.11-12.4		1. Create a series of flash cards identifying the basic structural features of trees and shrubs, characteristics of evergreens, and cards for common Missouri trees, shrubs, vines / groundcovers, perennials, and turf grasses. Each plant flash card should include the common and scientific names,	
2. Identify the distinguishing characteristics for common narrow-leaf evergreens				
3. Identify selected trees				
4. Identify selected shrubs				
5. Identify ground covers, vines, and perennials				
6. Identify characteristics of				

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grasses 7. Identify the six major turf grasses used in Missouri			pictures of each plant, and use characteristics.	
<b>D. Tool Identification and Maintenance</b>				
1. Identify and maintain hand tools and equipment 2. Identify, maintain, and safely use power tools	RI.11-12.7 RST.11-12.7 RST.11-12.8 RST.11-12.9		1. Have students research various types of hand and power tools/equipment used in the landscaping industry. Students need to research the prices, warranties, compare different brands, and interpret their effectiveness.	1. SL.11-12.4 & SL.11-12.6- Create a poster illustrating the various tools, prices, and warranties and present the information to class.
<b>E. Pesticides</b>				
1. Describe how various types of pesticides work 2. Accurately interpret a pesticide label for information about use, effectiveness, and safe handling 3. Identify safety precautions that should be followed when using pesticides.	WHST.11-12.2.a WHST.11-12.2.b WHST.11-12.2.e		1. Have an agricultural extension agent come in to give certification for pesticide application. After certification, students will need to talk/interview local greenhouse and landscaping companies to determine their role in worker protection standards and pesticide safety.	1. SL.11-12.4 & SL.11-12.6- Have students present their findings to the class based upon the interview conducted with the greenhouse and landscape owners/companies.
<b>F. Installation and Maintenance of Trees and Shrubs</b>				
1. Transplant a tree or shrub and properly plant a bare-root, container-grown, or B and B tree or shrub 2. Stake and guy a newly-planted tree; wrap, prune, and apply antitranspirants to young trees	G-MG.3		1. Apply geometric methods to solve design problems to draft (to scale) proper methods of transplanting various types of trees, methods of staking & guying (identifying angles needed), and properly pruning shrubs. After drafting the	

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3. Prune trees, shrubs, hedges, and roses			methods, discuss them as a class and then physically plant a tree with staking or guying and practice pruning. (Modeling)	
4. Fertilize trees and shrubs	G-MG.2 A-CED.3 N-Q.1		1. G-MG.2 & N-Q.1-Utilize fertilizer formulas and calculations to determine total pounds (density) of fertilizer needed based upon a calculated area. (Modeling)	1. A-CED.3-Fertilizer Calculations and Interpretation (ex. Describe nutrient and cost constraints based on different combinations of fertilizer).
5. Determine the best methods of irrigation in various situations	RI.11-12.7 RST.11-12.7 RST.11-12.8 RST.11-12.9 WHST.11-12.4 WHST.11-12.7 WHST.11-12.9		1. Have students research the factors which determine how often and at what rate various trees, shrubs, and containers must be irrigated, and evaluate and compare various irrigation systems needed for each situation. After researching have students prepare a brochure identifying information, pictures, and comparison charts of various irrigation systems.	
6. Recognize common insects and diseases, the type of damage or symptoms they cause, and recommended control methods	RST.11-12.1 WHST.11-12.1.a WHST.11-12.1.b WHST.11-12.1.c WHST.11-12.1.d WHST.11-12.1.e WHST.11.12.9		1. Utilize a given chart identifying common insects and diseases to solve case study scenarios and recommend proper control methods.	1. SL.11-12.5, SL.11-12.6, WHST.11-12.a-b, WHST.11-12.2e-Select and research a current landscape or turf grass control product and create a media sales presentation and present as a representative of the chemical company.

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<b>G. Installation and Maintenance of Bedding Plants and Ground Covers</b>				
1. Prepare the soil of a flower bed, determine the number of plants to use, and transplant bedding plants and ground covers	G-MG.2 G-MG.3		1. Given a specific area on a landscape design, students must calculate the total number of plants needed (density) based upon a required spacing and then draft onto the landscape design the various plants utilizing the correct symbols. (Modeling)	
2. Maintain bedding plants and ground covers				
<b>H. Turfgrass</b>				
1. List advantages and disadvantages of the six major turf grasses grown in Missouri	RI.11-12.7 RST.11-12.7 RST.11-12.8 RST.11-12.9		1. Have students work in group to research the advantages and disadvantages of the six major turf grass varieties grown in Missouri.	1. SL.11-12.5, SL.11-12.6, WHST.11-12.2 a-b, & WHST.11-12.e-Create a commercial emphasizing the advantages and disadvantages of each variety. During the commercial, it must include an interview from a local landscaper.
2. Describe the procedure for installing a lawn	N-Q.1 G-GPE.7 G-GMD.3		1. Students will be given a series of worksheets utilizing a specified scale to determine the area of various geometrical shapes. After practicing measuring and determining area students will need to evaluate and determine measurement for a landscape design, again with a specified scale. After	1. A-CED.3-Lawn Establishment and Fertilizer Calculations and Interpretation (ex. Describe lawn establishment / reestablishment, nutrient needs, and cost constraints based on different combinations of lawn establishment methods and fertilizer needs).
3. Maintain turf by properly fertilizing, watering, and mowing				
4. Explain how to successfully cultivate or renovate a lawn				

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			determining measurements, they will need to correctly calculate requirements needed to establish a new lawn utilizing various methods, fertilizing, and irrigation.	
5. Identify common pests in turf grass and explain how to control these pests	RST.11-12.1 WHST.11-12.1.a WHST.11-12.1.b WHST.11-12.1.c WHST.11-12.1.d WHST.11-12.1.e WHST.11.12.9		1. Utilize a given chart identifying common insects and diseases to solve case study scenarios and recommend proper control methods.	1. SL.11-12.5, SL.11-12.6, WHST.11-12.a-b, WHST.11-12.2e-Select and research a current landscape or turf grass control product and create a media sales presentation and present as a representative of the chemical company.
<b>I. Site Analysis and Evaluation</b>				
1. Analyze a landscape site 2. Draw a base map to scale 3. Effectively use design symbols in a landscape plan	G-CO.1 G-CO.5 N-Q.1		1. G-CO.1-Practice problems in determining the definitions of geometric terms and how to measure them (ex. Angle, circle, perpendicular and parallel lines, distance around a circular arc) and their utilization in identifying private, public, and service areas of a landscape and on a base map.	1. G-CO.5-Drafting projects. Provide students with a geometric figure (ex. House layout) and a rotation, reflection or translation of the figure and have student redraft it utilizing a new or different scale than the original, and then utilize geometric symbols to identify public, private, and service areas and effectively use design symbols.
<b>J. Selecting and Using Plants in the Landscape</b>				
1. Select trees for specific purposes in the landscape 2. Select effective shrubs and hedges for landscape	RST.11-12.1 WHST.11-12.1.a WHST.11-12.1.b WHST.11-12.1.c		1. Given a set of environmental factors/parameters for a case study, students need to select a series of plants for a given	1. SL.11-12.4 & SL.11-12.6- Have students present their selections to the class based upon the factors determining

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3. Describe the uses of vines and ground covers and select the species to suit the location to be planted	WHST.11-12.1.d WHST.11-12.1.e WHST.11.12.9		landscape/area based upon the environmental factors, space, and client needs.	plant selection.
4. Select a location and plants for a perennial bed or border				
5. Select a turf grass for a specific growing site				
<b>K. Landscape Designing</b>				
1. Identify and explain the four elements of landscape design	RI.11-12.7 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 WHST.11-12.1.b WHST.11-12.1.e		1. Divide the class into groups and assign each group an element, enrichment or principle of design, and a category of design (ex. English/country, xeriscaping, oriental, etc.). Have each group explain how its assigned design choice and category is correctly performed by giving an oral report and demonstration of the procedures. As a part of their demonstration, students would include appropriate visual elements, such as examples of designs exhibiting their required element. Students should be prepared to answer questions regarding their presentation.	1. WHST.11-12.6-Students utilize social media or Internet sources such as GoogleDocs or Prezi to work cooperatively together.  2. WHST.11-12.5-Require groups to turn in a rough draft copy to be graded for grammar, spelling, and structure. Work cooperatively with an English teacher to help with revisions.
2. Implement the use of natural and manufactured enrichments in a landscape plan				
3. Identify the five principles of design				
4. Apply both the principles and elements of design to create a landscape plan	N-Q.1 G-MG.3		1. G-MG.3-Design/Draft a landscape utilizing geometric shapes and scale in a layout that satisfies physical constraints and minimize costs based upon the	

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			topography. (Modeling)	
<b>L. Developing Cost Estimates</b>				
1. Calculate the price of landscape design	N-Q.1 G-GPE.7 G-GMD.3		1. G-GPE.7 & G-GMD.3-Utilze the landscape design to compute the areas and volumes of grass seed, sod, mulch or other ground covers needed.	1. N-Q.1- Organize the data into graphs or data displays.
2. Price various components of landscape maintenance	N-Q.1 N-Q.2 N-Q.3		1. N-Q.2 & N-Q.3-Calculate the price components for various aspects of landscape maintenance in a given case study to select appropriate quantities and choose an appropriate level of accuracy for limitations.	1. N-Q.1-Present the price findings as a client proposal in graph or data display form.
<b>M. Leadership and Personal Development for Advanced Students</b>				
1. Develop a resume and complete a job application	L.11-12.1		1. Develop a Resume 2. Complete a 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 Role Playing/Scenarios	
5. Describe the importance and process of developing better human relationships	SL.11-12.1		1. Role Playing 2. Group Discussion	Community Service Projects

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<i>N. Using the Missouri Agricultural Record Book for Secondary Students</i>				
1. Complete forms needed to open the Missouri Agricultural Record Book for Secondary Students				
2. Complete a budget for the SAE program	N-Q.1		1. Form 100/101 (SAE Enterprises/Agreement)	
3. Complete inventory and financial statement forms for the Missouri Agricultural Record Book for Secondary Students	N-Q.1		1. Complete Form 103 (Budget)	
4. Complete receipt and expenditure forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1		1. Complete 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		1. Complete Forms 6, 7, 8, 9, 10, 11, 12 (Financials)	

**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