



Enriching Students.
Sustaining Forests.

The Wisconsin K-12 Forestry Education Program



7-8 UNIT

Wisconsin K-12 Forestry Lesson Guide

LEAF is a partnership program between

Wisconsin Department of Natural Resources - Division of Forestry

and

Wisconsin Center for Environmental Education

College of Natural Resources
University of Wisconsin-Stevens Point





LEAF - Learning, Experiences, & Activities in Forestry

The Wisconsin K-12 Forestry Education Program

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LEAF was created to help promote forestry education in Wisconsin schools. In 2001, Wisconsin K-12 forestry education stakeholders evaluated the current status of and the needs for Wisconsin-based K-12 forestry education. A variety of programs existed, but voids were identified in delivery and dissemination of educational materials and services. To offer a more unified effort, stakeholders supported the development of a comprehensive program that would enhance existing efforts.

During the spring of 2001, legislation was written to establish the LEAF Program as a partnership between the Wisconsin Department of Natural Resources - Division of Forestry and the Wisconsin Center for Environmental Education at the College of Natural Resources, University of Wisconsin-Stevens Point. Core funding for the program is provided through a surcharge on the sale of seedlings from Wisconsin Department of Natural Resources - Division of Forestry nurseries.

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A RATIONALE FOR FORESTRY EDUCATION IN WISCONSIN

Wisconsin forests are ecologically, economically, emotionally, and socially essential to our well-being. Forests are also great places to learn. Learning in, and about, Wisconsin's forests adds relevance to all subject areas and builds ecological literacy necessary to help sustain our forests.

Historically, Wisconsin's forests provided jobs for a growing immigrant workforce, building materials for a developing nation, and dollars for a fledgling state economy. Forests continue today as an important part of Wisconsin. Our forests cover 46 percent of the state. They provide habitat for wildlife, recreational opportunities for residents and visitors, and a basis for a major part of Wisconsin's economy. Our forests benefit each of us through the protection of Wisconsin's air and water quality, their beauty, and the products they provide. Our forests are a basic human life support system, affecting the quality of life that we all enjoy.

Today, our forests face the greatest potential for change since 19th century logging. On the near horizon are changes in forest ecosystems, forest demands, and forest values. As our population continues to grow and the demands on our forests increase, Wisconsin's citizens will need to play an active role in sustaining our forests as ecosystems and human systems. To do this, our citizens need the knowledge and skills to make decisions and to understand the impact of their choices.

LEAF is a long-term program designed to bring together existing efforts and provide the resources necessary to help schools infuse forestry education into their current curriculum. This guide is a key component of the LEAF Program, helping to increase forestry literacy in Wisconsin schools.





INTRODUCTION TO THE GUIDE

The LEAF Wisconsin K-12 Forestry Lesson Guide provides educators with complete interdisciplinary units designed to present an overview of forestry in Wisconsin. With this unit-based approach, lessons build upon one another to provide connectivity in the students' educational experience. The lessons are also effective when taught individually and integrated with other classroom material. The units are divided by grade levels and include: K-1, 2-3, 4, 5-6, 7-8, and 9-12. Each unit contains classroom lessons, field enhancements, and a special careers exploration lesson.

The LEAF Lesson Guide is based on principles outlined in the LEAF Conceptual Guide to K-12 Forestry Education in Wisconsin. The Conceptual Guide outlines forestry education concepts appropriate for Wisconsin's K-12 students and the grade level at which they should be taught. Information in the Conceptual Guide is organized under four themes, posed as questions:

What?
is a forest...



The concepts in this theme provide students with a fundamental knowledge of Wisconsin's forests and help students appreciate forests as ecosystems.

Why?
are they important...



Concepts in this section help students investigate the connection between Wisconsin's forests and their own lives.

How?
do we sustain...



These concepts help students understand the role humans play in sustaining Wisconsin's forests.

What?
is the future...



Concepts in this theme help students identify ways to ensure Wisconsin's forests are sustained for future generations.

A copy of the complete LEAF Conceptual Guide to K-12 Forestry Education in Wisconsin may be downloaded from the LEAF website at www.uwsp.edu/cnr/leaf.



LESSON GUIDE SPECIAL FEATURES

CAREERS EXPLORATION

In each lesson you will find a career profile of a forestry professional. Use these profiles to help students explore careers by reading them aloud, handing them out, or creating a bulletin board. A careers lesson in each unit uses all of the career profiles from that unit.

FIELD ENHANCEMENTS

Take your students outside for some hands-on learning and fun. Each unit contains field enhancements that can be done in your schoolyard or school forest.

WEBSITE CONNECTION

Resources are available on the LEAF website that are required or will enhance lessons in the guides. The LEAF web pages will be enhanced over time, so visit often for the newest materials. www.uwsp.edu/cnr/leaf.

RECOMMENDED RESOURCES

A list of additional books, websites, or materials that will enhance the lessons is included at the end of each lesson. T

OTHER LEAF MATERIALS

LEAF WISCONSIN K-12 WILDLAND FIRE LESSON GUIDE

This guide teaches about the positive and negative impact of wildland fire in Wisconsin. Each grade-specific lesson focuses on a different fire-related topic.

LEAF WISCONSIN K-12 URBAN FOREST LESSON GUIDE

The Urban Forest Lesson Guide uses the places we live to provide a context for understanding forests. Lessons are grouped into three sections (K-4, 5-8, 9-12) with several classroom lessons in each.

VISIT OUR WEBSITE AT www.uwsp.edu/cnr/leaf

The LEAF website is a great source for information and resources. On it, you will find:

- Workshop and special event lists
- Online resources
- Online tree identification key
- LEAF lesson enhancements
- Educator opportunities
- Field experience providers
- School forest information



LESSON FORMAT

Lesson Number and Title

BIG IDEAS

The subconcepts covered in the lesson as defined by the *LEAF Conceptual Guide*.
(Subconcept Number)

OBJECTIVES

Knowledge and skills students acquire as a result of doing the activity.

SUBJECT AREAS

List of subjects addressed in the lesson.

LESSON/ACTIVITY TIME

Total time required to complete the lesson and breakdown of time required for each lesson component.

TEACHING SITE

Recommended location for teaching.

CLASSROOM LESSON/FIELD ENHANCEMENT CONNECTIONS

Lists complimentary classroom lessons and field enhancements.

MATERIALS LIST

Items needed to complete the activity. Listed as per student, group of students, class, or teacher.

TEACHER PREPARATION

Necessary preparation needed before teaching the lesson.

SAFETY PRECAUTIONS

Listed in the field enhancements when students are outside the classroom environment.

RECOMMENDED RESOURCES

Additional books, websites, or materials that will enhance the lesson.

NUTSHELL

Brief summary of the lesson.

BACKGROUND INFORMATION

Information that supports, accentuates, and expands on the information addressed in the Procedure.

PROCEDURE INTRODUCTION

A short discussion or activity that sets the mood for the rest of the lesson.

ACTIVITIES

Step-by-step instructions for the process involved in teaching the concepts.

CONCLUSION

A wrap-up and review of concepts of the lesson.

CAREERS

A profile of a forestry professional working in Wisconsin that relates to the careers lesson.

SUMMATIVE ASSESSMENT

Culminating questions or activities that have students apply learned information or skills to new situations.

REFERENCES

List of materials used in creating the lesson.

VOCABULARY

Key terms used or introduced in the activity.

KEY TO SYMBOLS USED THROUGHOUT THE LESSONS



Teacher Page



Student Page



Teacher Key



UNIT OVERVIEWS

*This **LEAF Wisconsin K-12 Forestry Lesson Guide 7-8 Unit** is one of six grade-specific units. An overview of the lessons included in each unit is included here for your reference.*

K-1 UNIT

5 CLASSROOM LESSONS, 1 CAREERS LESSON, 3 FIELD ENHANCEMENTS

The K-1 Unit is an introduction to trees and forests. Students learn about the parts of a tree, what forests are, and why they are important.

LESSON 1 - TREE HARDWARE

Students are introduced to the parts of a tree and its life stages through songs, games, and role playing.

LESSON 2 - WHAT'S IN A FOREST?

Students learn about living and nonliving parts of a forest by playing a game and creating artwork.

LESSON 3 - MY FAVORITE FOREST USE

Students discover the value of forests by studying *Tree Spy* collages and singing a song.

LESSON 4 - FOREST PRODUCT TIME MACHINE

Students explore historical uses of forest resources and compare them to present-day goods by surveying pictures and creating drawings.

LESSON 5 - ANIMALS NEED FORESTS TOO

Students find out what forests do for animals and play a game to search for basic needs.

CAREERS EXPLORATION

Students learn about forestry-related careers, participate in a matching exercise, and draw their favorite career.

FIELD ENHANCEMENT 1 - ALL ABOUT MY TREE

Students adopt a tree and record their observations to create a class scrapbook.

FIELD ENHANCEMENT 2 - SENSING THE FOREST

Students use all their senses to discover the living and nonliving parts of a forest.

FIELD ENHANCEMENT 3 - SEARCHING FOR BASIC NEEDS

Students examine the needs of animals and evaluate if their playground can support various critters.

2-3 UNIT

6 CLASSROOM LESSONS, 1 CAREERS LESSON, 3 FIELD ENHANCEMENTS

The 2-3 Unit expands on basic ideas about forests and helps students understand their connection to forests. Students learn about energy flow, basic tree identification skills, forest products, and what it means to be a forest steward.

LESSON 1 - TO BE A TREE

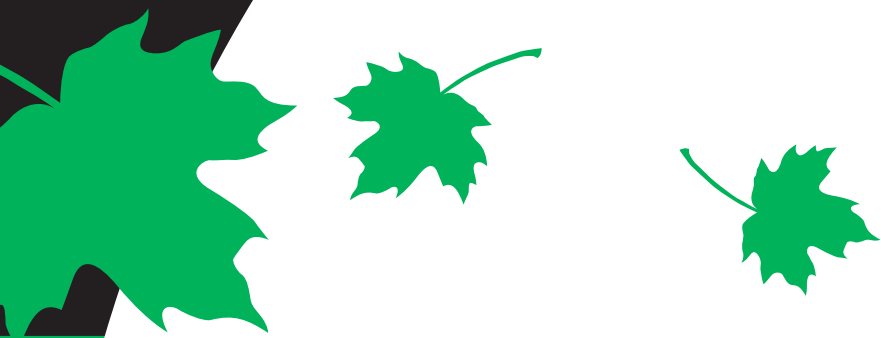
Students use their knowledge of tree parts to learn basic tree identification skills. Basic needs and life stages of a tree are also emphasized through a game and drawing activity.

LESSON 2 - WHAT MAKES A FOREST?

Students discover how living things are influenced by nonliving things through a matching activity, song or skit, and creating a class mural of Wisconsin forests.

LESSON 3 - FOREST ENERGY FLOW

Students learn about energy flow in the forest by role-playing producers, consumers, and decomposers.



LESSON 4 - FORESTS ARE IMPORTANT TO ME!

Students explore forest values and discover what forest products come from Wisconsin using a checklist. Creative writing and an art project help students examine why they value forests.

LESSON 5 - DECISIONS, DECISIONS

Students are introduced to the concept of forest management by creating a plan for their schoolyard. A card game and song highlight some of the people involved in forest management.

LESSON 6 - I CAN BE A FOREST STEWARD

Students find out what it means to be a forest steward and make decisions about good stewardship activities through an *I Spy*-like picture and board game.

CAREERS EXPLORATION

Students learn about professionals in Wisconsin with forestry-related careers, match jobs and duties, and draw themselves in a career that interests them.

FIELD ENHANCEMENT 1 - I CAN BE A FORESTER

Students get a taste of what foresters do by collecting and discussing data.

FIELD ENHANCEMENT 2 - OBSERVING FOREST INTERACTIONS

Students explore living and nonliving forest features on a hike and spend time observing and drawing parts of a forest.

FIELD ENHANCEMENT 3 - FOREST ENERGY SCAVENGER HUNT

Students follow the flow of energy in a forest by going on a scavenger hunt.

4 UNIT

7 CLASSROOM LESSONS, 1 CAREERS LESSON, 3 FIELD ENHANCEMENTS

The 4 Unit focuses on Wisconsin forest history. Students learn about the logging days, farming the Cutover, events that led to modern forestry, and why forests are important today.

LESSON 1 - NATIVE AMERICANS AND THE FOREST

Students read the journal of an early explorer to learn what Wisconsin forests were like before European settlement and how Native Americans used the forests.

LESSON 2 - FORESTS BUILT OUR STATE

Students explore the importance of forests to early settlers and learn how forests played a role in settling Wisconsin through a mapping activity.

LESSON 3 - HELP WANTED – LUMBERJACKS

Students examine the steps and people involved in an 1800s logging process by following a tree from northern Wisconsin to a house in Iowa.

LESSON 4 - BROKEN DREAMS

Students experience what it was like to farm in Wisconsin during the “Cutover” by role-playing and studying letters, photographs, and documents.

LESSON 5 - I SAW IT ON THE 6 O’CLOCK NEWS

Students learn about 150 years of events in Wisconsin that have led to the forests of today by participating in a live newscast.



LESSON 6 - FORESTS ARE IMPORTANT TO YOU AND ME

Students discover reasons why Wisconsin forests are important to our quality of life through guided imagery, brainstorming, and an interactive media presentation.

LESSON 7 - SUSTAINING OUR FORESTS

Students are introduced to the sustainability and stewardship of forests by listening to a fable, brainstorming, reading situation cards, and creating an art project.

CAREERS EXPLORATION

Students learn about professionals in Wisconsin with forestry-related careers, play career bingo to learn about skills used in each profession, and describe and draw themselves in a career.

FIELD ENHANCEMENT 1 - UNLOCKING A FOREST'S PAST

Students uncover a forest's history by becoming detectives, collecting data, and making predictions about a forest.

FIELD ENHANCEMENT 2 - ARE FORESTS IMPORTANT TODAY?

Students find out why forests are ecologically, economically, and socially valuable by searching in a forest and playing scavenger hunt bingo.

FIELD ENHANCEMENT 3 - CARING FOR THE FUTURE OF FORESTS

Students learn what a tree needs to grow, how to choose an appropriate site, and how to properly plant a tree by putting one in their schoolyard.

5-6 UNIT

8 CLASSROOM LESSONS, 1 CAREERS LESSON, 3 FIELD ENHANCEMENTS

The 5-6 Unit connects the science of forests with human aspects. Students learn about forest layers, ecosystems, and energy flow. This information is related to the value of trees, forest ownership, and management.

LESSON 1 - ME AS A TREE

Students learn about a tree's functions, basic needs, life stages, and role in the forest community by comparing trees and humans.

LESSON 2 - WHAT MAKES A FOREST?

Students explore parts of forest ecosystems and forest layers through an interactive game and discussion.

LESSON 3 - FORESTS ARE ALWAYS CHANGING

Students examine forest succession, disturbances, and renewability by completing a sustainability worksheet and role-playing.

LESSON 4 - ECOSYSTEM EXTRAVAGANZA

Students are introduced to forest functions such as photosynthesis, energy flow, and the cycling of matter through reading and creating a diagram. The roles of producers, consumers, and decomposers in forests are also examined.

LESSON 5 - WE ALL NEED TREES

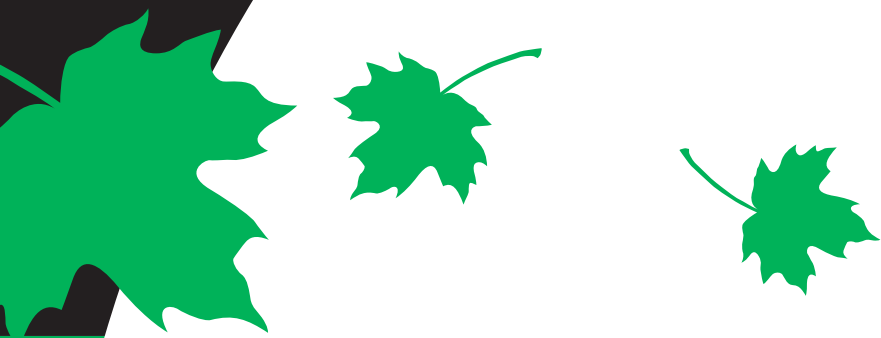
Students learn about the values of forests and their impact on the environment by categorizing values and writing and producing a commercial.

LESSON 6 - WHAT IS MANAGEMENT?

Students discover what's happened in Wisconsin's history that led us to modern forestry and about management techniques by creating a timeline and reading a "choose your own adventure" type story.

LESSON 7 - WHO OWNS IT?

Students observe how management goals of landowners impact forest ecosystems by studying a plat map and answering questions. They also learn about the roles individuals and groups play that affect forest management.



LESSON 8 - WHOSE JOB IS IT?

Students learn about stewardship and how their choices affect the future of forests by participating in a mock school board meeting.

CAREERS EXPLORATION

Students become aware of careers that are forestry-related by listening to descriptions of them and playing charades.

FIELD ENHANCEMENT 1 - WOOD'S WORTH

Students make their own tree scale stick and use it to calculate the number of products that can be made from individual trees. They also go on a scavenger hunt to explore many ways that forests are valuable.

FIELD ENHANCEMENT 2 - STUDYING FOREST LAYERS

Students observe the structural layers of a forest and draw a color-coded picture. They also embark on two exploration activities to discover which animals can be found in each of the forest layers.

FIELD ENHANCEMENT 3 - COMPETITION IN A FOREST

Students learn how trees compete for their basic needs through observation and a simulation.

7-8 UNIT

8 CLASSROOM LESSONS, 1 CAREERS LESSON, 3 FIELD ENHANCEMENTS

The 7-8 Unit highlights a wide variety of topics related to Wisconsin's forests. Students learn about forest biomes, types of forests, biodiversity, forest management, forest trends, forest issues, forest products, and sustaining forests.

LESSON 1 - DISCOVERING WISCONSIN'S FORESTS

Students are introduced to the types of forests in Wisconsin and factors that affect their distribution through data comparison, a mapping activity, and video research.

LESSON 2 - BIODIVERSITY AND THE FOREST CONNECTION

Students analyze three ecosystems to determine their interconnections and create a Venn diagram. They also discuss the value of Wisconsin's forests in terms of biodiversity.

LESSON 3 - HOW FORESTS ARE MANAGED

Students explore forest management plans, multiple use, and sustainability through a simulation, video, and game.

LESSON 4 - FOREST MANAGEMENT ISSUES

Students examine forest management, factors that influence decisions, effects, and conflicts through brainstorming, discussion, and issue analysis.

LESSON 5 - MANY FORESTS, MANY VALUES, MANY REASONS

Students assess forest values and discover how forests shape the economy, environment, and society using games, story analysis, and brainstorming.

LESSON 6 - MAKING BROADER CONNECTIONS

Students make connections between forests of Wisconsin and forests worldwide and discuss challenges to Wisconsin's forests by tracing the life cycle of a product and playing Forest Jeopardy. They also participate in a sustainability simulation to learn about demand.

LESSON 7 - KEY STRATEGIES FOR OUR FUTURE

Students learn how science, technology, and collaboration are keys to sustaining Wisconsin's forests by analyzing articles. They then make predictions about the future by creating a Fantasy Future Forest.



LESSON 8 - SUSTAINING OUR FORESTS – CITIZENS’ ROLES

Students discover how people in Wisconsin practice good forest stewardship and debate their own choices through jigsaw readings and dilemma cards.

CAREERS EXPLORATION

Students learn about professionals in Wisconsin with forestry-related careers and examine the skills, education, and experience necessary for each type of job.

FIELD ENHANCEMENT 1 - TREE IDENTIFICATION

Students are introduced to dichotomous keys and tree identification vocabulary to identify common Wisconsin trees.

FIELD ENHANCEMENT 2 - FOREST MAPPING

Students work in groups to map features of a forest plot using data collection, tree identification, measurement, and ageing.

FIELD ENHANCEMENT 3 - FOREST DIVERSITY

Students study and collect data on three components of diversity that can be found in Wisconsin forests.

9-12 UNIT

5 CLASSROOM LESSONS, 1 CAREERS LESSON

The 9-12 Unit has an environmental science focus. Students learn about forest ecosystem processes, succession, the economics of forest products, and science and technology.

LESSON 1 - THE FOREST ODYSSEY

Students learn about forest ecosystem functions and processes by reading an Aldo Leopold essay, doing research, and creating an original science-based essay as a class.

LESSON 2 - A HISTORY OF SUCCESSION

Students explore how Wisconsin’s forests have changed due to human and natural influences through a teacher presentation, readings, and a video. Current changes in Wisconsin’s forests are discussed using a Wisconsin Land Cover Map.

LESSON 3 - FOREST BIODIVERSITY: TREE CASE STUDIES

Students study how Wisconsin’s climate and natural history influence forest biodiversity. They use case studies to develop insights into the question, “What is a healthy level of forest biodiversity?” In groups, they create an original poster and presentation.

LESSON 4 - THE FOREST MARKETPLACE

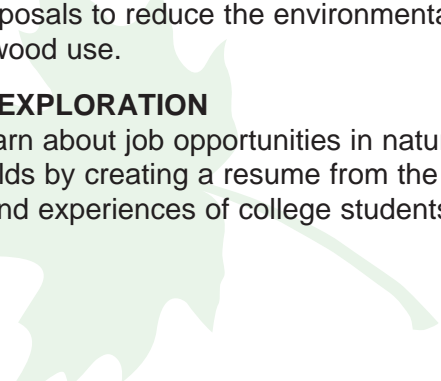
Students identify factors that influence the supply of and demand for forest resources using basic economic principles. Using veneer as an example, students use graphs to describe markets in different geographic regions and examine the relationship between Wisconsin’s forest resources and those of the rest of the world.

LESSON 5 - FOREST SCIENCE AND TECHNOLOGY

Students analyze the environmental impacts associated with wood, concrete, and steel by creating life cycle analyses. They study the roles that forest management, technology, and consumption play in sustaining forests and develop proposals to reduce the environmental impacts of wood use.

CAREERS EXPLORATION

Students learn about job opportunities in natural resource fields by creating a resume from the education and experiences of college students in Wisconsin.





9-12 FIELD EXPERIENCE UNIT

1 CLASSROOM LESSON, 5 FIELD LESSONS

The 9-12 Field Experiences are available for download on the LEAF website www.uwsp.edu/cnr/leaf.

LESSON 1 - GEOGRAPHIC INFORMATION SYSTEMS

Students use a Geographic Information System (GIS) to study the regional geography of their school forest. Students use geography terms to describe aspects of their community and region. They study maps and records that illustrate land use history. Students then use fGIS to analyze geographic data and print a map of Wisconsin and their school forest region.

LESSON 2 - SCHOOL FOREST RESEARCH PLOTS

Students work together to plan and establish research plots in their school forest. Students learn about statistical sampling, and use a map and a sampling procedure to locate research plot centers in their school forest. In small groups, students work in the field to establish the plots in their school forest.

LESSON 3 - READING THE FOREST LANDSCAPE

Students learn how to interpret the disturbance history of a forest by using evidence and applying the ecological principles of change and interconnectivity. Students use a narrative to visualize how the physical world is interconnected and constantly changing. They discuss how forests change and explore disturbances common in Wisconsin forest ecosystems. They use evidence present in the forest landscape to interpret the disturbance history of their school forest. As a class, students form a consensus view of their school forest disturbance history.

LESSON 4 - TIMBER CRUISE

Students conduct a timber cruise of their school forest to identify the species of trees, volumes of timber, and basal area on the property. Students work in small groups to collect data and use Kruzer software to analyze the complete class data set.

LESSON 5 - HABITAT ASSESSMENT

Students use wildlife habitat requirements to assess potential animal habitat based on map interpretation, plant and forest inventory information, on-site forest composition and structure, and wildlife habitat needs.

LESSON 6 - COMMUNITY ASSETS

Students describe their community's assets, stakeholders, and critical issues. Students use an economic flow diagram to understand the relationships between people and resources. As a group, students identify assets and stakeholders in their local community. Students organize a community forum in which they interview local leaders to identify important issues and the actions being taken. Students identify opportunities to learn more and become involved.



