

APPENDIX

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GLOSSARY

ABIOTIC: Nonliving things.

ARBORICULTURE: The planting, care, and scientific cultivation of trees on an individual plant basis.

ARBORIST: A person who takes care of individual trees by pruning, removing, or treating them.

BENEFITS: Things that are good.

BIAS: An opinion or belief that strongly favors one side of an issue.

BIODIVERSITY: The variety and complexity of all life on earth.

BIOTIC: Living things.

CANOPY: The leaves and branches of a tree or group of trees.

CARBON SEQUESTRATION: The capture and storage of carbon dioxide from the atmosphere into biotic (e.g., trees) or abiotic (e.g., coal) pools of carbon.

COMMUNITY: The plants and animals living in an area.

DRAWBACKS: Things that are not good.

ECOSYSTEM: (K-4) An area that contains living and nonliving things existing together and interacting. Ecosystems come in all sizes. (e.g., forest, meadow, log).

ECOSYSTEM: (5-8, 9-12) An area that contains organisms (e.g., plants, animals, bacteria) interacting with one another and their nonliving environment (e.g., climate, soil, topography).

ENERGY WEB: A system where energy is transferred through a series of interconnected food chains.

EVAPOTRANSPIRATION: The loss of water by evaporation from the soil surface and by transpiration from plants.

EXOTIC SPECIES: A species from a specific geographic region that has been introduced into an area outside of that region.

FERTILIZE: Add minerals and nutrients to the soil for plants to use.

FOREST: An ecosystem that is characterized by a dominance of tree cover and contains a variety of other organisms (e.g., other plants, animals).

GREENING: The process of adding plants (things that are green) to a community.

GREEN SPACE: An area in a city, town, or village, containing mostly plants with few buildings, roads, or other structures.

HABITAT: A place where a plant or animal can get the food, water, and shelter it needs to live.

HEAT ISLAND: The phenomenon that, because concrete and asphalt absorb and radiate heat, cities are five to nine degrees warmer than rural areas.

INSPECT: Carefully examine a tree for defects, decay, disease, insect damage, or other problems.

INVASIVE SPECIES: A species that enters an area and causes harm by outcompeting species that are already there.

INVENTORY: Make a list of the number, size, species, health, etc., of trees in a given area.

MATTER CYCLING: An ecosystem function in which elements are deposited, used by organisms, and stored or exported.

MONITOR: Make regular visits to a tree to keep track of its growth, health, and general condition.

MULCH: *(K-4)* Material such as woodchips, bark, or straw spread on the ground to protect trees and hold in moisture.

MULCH: *(9-12)* Put woodchips, shredded bark, straw, or another similar material around the base of a tree to protect it from lawnmower damage and help prevent it from drying out.

NATIVE SPECIES: A species that exists within its natural range.

PEST AND DISEASE CONTROL: Identify an insect, animal, or disease on a tree or trees and determine the best course of action.

PLANT: Establish trees in proper locations.

POLLUTION: Things put into the environment that are harmful. Pollution can be things such as chemicals, dust, and litter.

PRUNE: Trim branches by cutting dead, unhealthy, or poorly formed branches.

REMOVE: Cut a tree down and take it away from the site.

RENEWABLE RESOURCE: A resource that has the ability to regenerate, grow back, or produce more.

RUNOFF: Water that flows on the surface of the ground.

RURAL FOREST: A forest ecosystem found in the countryside outside of cities, towns, or neighborhoods.

SOIL COMPACTION: The elimination of air spaces in soil due to pressure being exerted on it.

STEWARD: A person who takes responsibility to make decisions and take actions today that will allow resources to be maintained in a healthy manner.

TREE BOARD/TREE GROUP: A group of people in a community who work together to increase awareness, educate citizens, and promote urban forests in local government.

URBAN FOREST: A forest ecosystem that includes all the trees and other vegetation in and around a town, village, or city. Plants, people, and animals are part of the urban forest.

URBAN FOREST MANAGEMENT: The use of planning and science-based techniques (e.g., planting, mulching, pruning, removal, monitoring, evaluation) to meet desired outcomes.

URBAN FORESTER: *(K-4)* A person who plants and takes care of the trees in cities, towns, and neighborhoods.

URBAN FORESTER: *(9-12)* A person who manages an urban forest as a whole.

WATER: Provide a tree with water when it has been newly planted or during dry spells.

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WISCONSIN MODEL ACADEMIC STANDARDS

LEAF lessons address Wisconsin Model Academic Standards in Agriculture Education, Environmental Education, Language Arts, Mathematics, Science, Social Studies, and Visual Arts. On the following pages, you will find the standards listed by unit and lesson along with an explanation of how they are addressed by each lesson.

K-4TH GRADE UNIT

LESSON 1: WHAT'S AN URBAN FOREST?

ENVIRONMENTAL EDUCATION B.4.5

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Describe natural and human-built ecosystems in Wisconsin.

Students list living and nonliving things found in both urban forest and rural forest ecosystems. Students also explore how those living and nonliving things are connected.

ENVIRONMENTAL EDUCATION B.4.7

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Draw a simple hydrologic cycle.

Students learn about the hydrologic cycle on a broad scale, then describe how water flows through their urban environment.

LANGUAGE ARTS A.4.1

Reading and Literature

Standard is: Use effective reading strategies to achieve their purposes in reading. Read aloud with age-appropriate fluency, accuracy and expression.

Students read their story of a raindrop aloud to the class.

LANGUAGE ARTS B.4.1

Writing

Standard is: Create or produce writing to communicate with different audiences for a variety of purposes.

Students write a story of the life of a raindrop as it falls into an urban area.

LANGUAGE ARTS B.4.2

Writing

Standard is: Plan, revise, edit, and publish clear and effective writing.

Students write a story of the life of a raindrop as it falls onto an urban area.

SCIENCE F.4.4

Life and Environmental Science: Organisms and Their Environment

Standard is: Using the science themes, develop explanations for the connections among living and nonliving things in various environments.

Students identify how living and nonliving things interact in the urban environment.

LESSON 2: URBAN FOREST BENEFITS

AGRICULTURE E.4.1

Ecology/Environment

Standard is: Identify various plants and animals and the ways humans benefit from them.

Students identify the benefits humans receive from trees in an urban environment.

ENVIRONMENTAL EDUCATION B.4.5

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Describe natural and human-built ecosystems in Wisconsin.

Students tell a story either visually or with words to describe parts of an urban environment and how they interact with each other.

ENVIRONMENTAL EDUCATION C.4.4

Environmental Issue Investigation Skills

Standard is: Identify some of the decisions and actions related to the issue.

Students either draw an ending to an existing story resolving a difference of opinion, or create their own story about differing viewpoints about trees including a resolution to the conflict.

ENVIRONMENTAL EDUCATION C.4.5

Environmental Issue Investigation Skills

Standard is: Identify proposed solutions to the issue and discuss arguments for and against the issue.

Students either draw an ending to an existing story resolving a difference of opinion, or create their own story about differing viewpoints about trees including a resolution to the conflict.

LANGUAGE ARTS A.4.1

Reading and Literature

Standard is: Use effective reading strategies to achieve their purposes in reading. Read aloud with age-appropriate fluency, accuracy, and expression.

In Variation 2, students read their story about the benefits and drawbacks of a tree to the class.

LANGUAGE ARTS B.4.1

Writing

Standard is: Create or produce writing to communicate with different audiences for a variety of purposes.

In Variation 2, students write a story about the benefits and drawbacks of a tree.

LANGUAGE ARTS B.4.2

Writing

Standard is: Plan, revise, edit, and publish clear and effective writing.

In Variation 2, students write a story about the benefits and drawbacks of a tree.

LANGUAGE ARTS C.4.3

Oral Language

Standard is: Participate effectively in discussion.

Throughout the lesson students are asked to think about questions and participate in group discussion.

SOCIAL STUDIES E.4.7

The Behavioral Sciences: Individuals, Institutions, and Society

Standard is: Explain the reasons why individuals respond in different ways to a particular event and the ways in which interactions among individuals influence behavior.

Students discuss the characters in the story and the motivations for their opinions.

VISUAL ARTS E.4.1

Visual Communication and Expression

Standard is: Communicate basic ideas by producing studio art forms such as drawings, paintings, prints, sculpture, jewelry, fibers, and ceramics.

In Variation 1, students draw a scene from the story they just heard and then draw the conclusion they come up with for the story.

LESSON 3: TAKING CARE OF URBAN FORESTS

ENVIRONMENTAL EDUCATION C.4.1

Environmental Issue Investigation Skills

Standard is: Identify environmental problems and issues.

Students learn about problems that urban forests face in the Tree's Life game.

ENVIRONMENTAL EDUCATION C.4.4

Environmental Issue Investigation Skills

Standard is: Identify some of the decisions and actions related to the issue.

Students learn about problems that urban forests face in the Tree's Life game and potential management solutions.

LANGUAGE ARTS B.4.1*Writing*

Standard is: Create or produce writing to communicate with different audiences for a variety of purposes.

Students write about how each of the management activities they chose are used in urban forests and how they might relate to rural forests.

LANGUAGE ARTS B.4.2*Writing*

Standard is: Plan, revise, edit, and publish clear and effective writing.

Students write about how each of the management activities they chose are used in urban forests and how they might relate to rural forests.

LANGUAGE ARTS C.4.3*Oral Language*

Standard is: Participate effectively in discussion.

Throughout the lesson students are asked to think about questions and reply in group discussion.

LANGUAGE ARTS D.4.1*Language*

Standard is: Develop their vocabulary and ability to use words, phrases, idioms, and various grammatical structures as a means of improving communication.

Students learn words related to urban forest management to communicate.

LESSON 4: URBAN FOREST STEWARDSHIP**ENVIRONMENTAL EDUCATION C.4.1***Environmental Issue Investigation Skills*

Standard is: Identify environmental problems and issues.

Students learn about issues through situation cards.

ENVIRONMENTAL EDUCATION C.4.3*Environmental Issue Investigation Skills*

Standard is: Identify people and groups of people that are involved in the issue.

Students play the Forest Influencers card game to learn about people who are involved in urban forest management.

ENVIRONMENTAL EDUCATION C.4.4*Environmental Issue Investigation Skills*

Standard is: Identify some of the decisions and actions related to the issue.

Students use situation cards and discussion to think about decisions and actions they could take to be good stewards.

ENVIRONMENTAL EDUCATION D.4.3*Decision and Action Skills*

Standard is: Identify two or more ways to take positive environmental action; e.g., posters, letters, and speeches.

Students create a shield that shows ways they can be stewards of the urban forest.

ENVIRONMENTAL EDUCATION D.4.5*Decision and Action Skills*

Standard is: Explain how they can influence an environmental issue.

Students brainstorm ways they can act as stewards of urban forests.

LANGUAGE ART C.4.1*Oral Language*

Standard is: Orally communicate information, opinions, and ideas effectively to different audiences for a variety of purposes – distinguish between fact and opinion and provide evidence to support opinions.

Students participate in a situation card discussion and debate what actions would help sustain urban forests.

LANGUAGE ARTS C.4.3

Oral Language

Standard is: Participate effectively in discussion, reflect on the ideas and opinions of others, and respond thoughtfully.

Students participate in a situation card discussion and debate what actions would help sustain urban forests.

VISUAL ARTS E.4.1

Visual Communication and Expression

Standard is: Communicate basic ideas by producing studio art forms such as drawings, paintings, prints, sculpture, jewelry, fibers, and ceramics.

Students draw a scene to depict the importance of urban forests and the actions they can take to be good stewards.

5TH-8TH GRADE UNIT

LESSON 1: URBAN FOREST CONNECTIONS

AGRICULTURE E.8.2

Ecology/Environment

Standard is: Describe and give examples of how land use impacts the environment – explain how urbanization has impacted native ecosystems.

Students examine the connections between the urban forest and other ecosystems using the water cycle as an example.

ENVIRONMENTAL EDUCATION B.8.5

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Give examples of human impact on various ecosystems.

Students create an urban forest ecosystem web and show how humans are connected to other parts of it. They identify the significant influence humans have on that ecosystem. In addition they specifically look at the water cycle and how urban forests are part of it.

ENVIRONMENTAL EDUCATION B.8.8

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Explain interactions among organisms or populations of organisms.

Students create an urban forest ecosystem web to examine the interactions among organisms, and between organisms and the nonliving environment.

ENVIRONMENTAL EDUCATION B.8.10

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Explain and cite examples of how humans shape the environment.

Students create an urban forest ecosystem web and show how humans are connected to other parts of it. To create this web, students must use verbs to show how various parts of the ecosystem, including humans, impact other parts.

ENVIRONMENTAL EDUCATION B.8.11

Knowledge of Environmental Processes and Systems: Energy and Ecosystems

Standard is: Describe our society as an ecosystem.

Students use their school as an example of a system of living and nonliving things. They then identify their school as an ecosystem.

LANGUAGE ARTS D.8.1

Language

Standard is: Develop their vocabulary and ability to use words, phrases, idioms, and various grammatical structures as a means of improving communication. Consult dictionaries, thesauruses, handbooks, and grammar texts when choosing words, phrases, and expressions for use in oral and written presentations.

Students reference dictionaries to help formulate a definition of “urban forest” and “ecosystem.” They also choose appropriate verbs to link parts of an urban forest ecosystem.

LESSON 2: URBAN FOREST BENEFITS

LANGUAGE ARTS B.8.1

Writing

Standard is: Create or produce writing to communicate with different audiences for a variety of purposes.

- Write clear and pertinent responses to verbal or visual material that communicate, explain, and interpret the reading or viewing experience to a specific audience.

In the Conclusion, students list three benefits of an urban forest they learned from the activity. They are assigned to write a description of how well their own urban forest provides these benefits and how the benefits impact ecosystems and people outside of their urban forest.

LANGUAGE ARTS B.8.2

Writing

Standard is: Plan, revise, edit, and publish clear and effective writing.

- Given a writing assignment to be completed in a limited amount of time, produce a well developed, well organized, and effective response in correct English and an appropriate voice.

In the Conclusion, students are given a specific amount of time to list three benefits of an urban forest they learned from the Activity. They are assigned to write a description of how well their own urban forest provides these benefits and how the benefits impact ecosystems and people outside of their urban forest.

LANGUAGE ARTS C.8.1

Oral Language

Standard is: Orally communicate information, opinions, and ideas effectively to different audiences for a variety of purposes.

- Share brief impromptu remarks about topics of interest to oneself and others.

In the discussion of the Activity, students offer their opinions about the urban forest benefits they would like to have or have more of in their community.

LANGUAGE ARTS C.8.3

Oral Language

Standard is: Participate effectively in discussion.

- Participate in discussion by listening attentively, demonstrating respect for the opinions of others, and responding responsibly and courteously to the remarks of others.
- Establish and maintain an open mind when listening to others' ideas and opinions.
- Display and maintain facial expressions, body language, and other response cues that indicate respect for the speaker and attention to the discussion.
- Participate in discussion without dominating.

Class discussions in the Introduction and Activity encourage students to listen, participate, use appropriate body language, and use other discussion skills.

LESSON 3: MANAGEMENT DECISIONS AND BIODIVERSITY

ENVIRONMENTAL EDUCATION A.8.4

Questioning and Analysis

Standard is: Use critical-thinking strategies to interpret and analyze gathered information.

Students gather data from a map of an urban forest and are asked to think critically and answer questions about what the information shows about biodiversity.

ENVIRONMENTAL EDUCATION A.8.5

Questioning and Analysis

Standard is: Use the results of their investigations to develop answers, draw conclusions, and revise their personal understanding.

Students gather data from a map of an urban forest and are asked to analyze the data and draw conclusions about what it means to the biodiversity of the area depicted.

ENVIRONMENTAL EDUCATION A.8.6

Questioning and Analysis

Standard is: Communicate the results of investigations by using a variety of media and logically defend their answers.

In the Conclusion exercise, students create a PowerPoint or use another presentation technique to demonstrate their understanding of biodiversity and the impacts of individual species.

ENVIRONMENTAL EDUCATION B.8.3

Knowledge of Environmental Processes and Systems – Energy and Ecosystems

Standard is: Explain the importance of biodiversity.

Throughout the lesson, biodiversity is defined and students are asked to consider the importance of biodiversity.

ENVIRONMENTAL EDUCATION B.8.14

Knowledge of Environmental Processes and Systems – Natural Resources and Environmental Quality

Standard is: Identify natural resources that are found in Wisconsin and those that are imported.

In Activity 2, students identify where the species we plant in the urban forest come from in the world.

LANGUAGE ARTS E.8.3

Media and Technology

Standard is: Create media products appropriate to audience and purpose.

In the Conclusion exercise, students create a PowerPoint or use another presentation technique to demonstrate their understanding of biodiversity and the impacts of individual species.

MATHEMATICS A.8.1

Mathematical Processes

Standard is: Use reasoning abilities to

- Evaluate information
- Perceive patterns
- Identify relationships
- Formulate questions for further exploration
- Test reasonableness of results

In Activity 1, students evaluate data to find patterns in the urban forest, examine the relationship between biodiversity and forest health, and answer questions about species distribution.

MATHEMATICS B.8.5

Number Operations and Relationships

Standard is: Apply proportional thinking in a variety of problem situations that include, but are not limited to

- Ratios and proportions (e.g., rates, scale drawings, similarity)
- Percents, including those greater than 100 and less than one (e.g., discounts, rate of increase or decrease, sales tax)

Students collect data about trees from a map and compare the proportions of species and size of trees from their map to the entire city population.

MATHEMATICS E.8.4

Statistics and Probability

Standard is: Use the results of data analysis to

- Make predictions
- Develop convincing arguments
- Draw conclusions

Students discuss the results of their analysis of the tree inventory data. They explain their opinions and conclusions on what the data show.

LESSON 4: STEWARDSHIP CLOSE TO HOME

ENVIRONMENTAL EDUCATION D.8.5

Decision and Action Skills

Standard is: Explain how personal actions can impact an environmental issue: e.g., doing volunteer work in conservation.

Students read profiles of various groups and individuals who are advocates for urban forests. They identify the actions those groups and individuals take. Students also identify actions they could take themselves.

ENVIRONMENTAL EDUCATION D.8.6

Decision and Action Skills

Standard is: Develop a plan for improving or maintaining some part of the local environment and identify their role in accomplishing this plan.

Students evaluate groups working to improve forests. They are asked to decide if they would be able to be involved and how they might help.

LANGUAGE ARTS A.8.1

Reading and Literature

Standard is: Use effective reading strategies to achieve their purposes in reading.

- Select, summarize, paraphrase, analyze, and evaluate, orally and in writing, passages of texts chosen for specific purposes.

Students are asked to read the Steward Profiles and summarize the information about the group orally.

LANGUAGE ARTS C.8.2

Oral Language

Standard is: Listen to and comprehend oral communications.

Students listen to the summary of Steward Profiles presented orally by other students.

LANGUAGE ARTS E.8.1

Media and Technology

Standard is: Use computers to acquire, organize, analyze, and communicate information.

- Collect information from various online sources, such as web pages, news groups, and listservs.

Student complete a guided web search in the conclusion activity to learn more about forest stewardship organizations.

SOCIAL STUDIES C.8.8

Political Science and Citizenship: Power, Authority, Governance, and Responsibility

Standard is: Identify ways in which advocates participate in public policy debates.

Students read profiles of various groups and individuals who are advocates for urban forests. They identify the actions those groups and individuals take.

SOCIAL STUDIES E.8.4

The Behavioral Sciences: Individuals, Institutions, and Society

Standard is: Describe and explain the means by which individuals, groups, and institutions may contribute to social continuity and change within a community.

Students read profiles of various groups and individuals who are advocates for urban forests. They identify the actions those groups and individuals take.

9TH-12TH GRADE UNIT

LESSON 1: WHAT'S IT WORTH?

ENVIRONMENTAL EDUCATION B.12.2

Knowledge of Environmental Processes and Systems – Energy and Ecosystem

Standard is: Describe the value of ecosystems from a natural and human perspective: e.g., food, shelter, flood control, water purification.

Students analyze data about the value of trees to energy conservation, stormwater retention, and other ecological, economic, and social perspectives.

ENVIRONMENTAL EDUCATION B.12.12*Knowledge of Environmental Processes and Systems – Natural Resources and Environmental Quality*

Standard is: Evaluate the environmental and societal costs and benefits of allocating resources in various ways and identify management strategies to maintain economic and environmental sustainability.

Throughout the lesson, students compare the costs and benefits of the presence and maintenance of trees in an urban forest ecosystem. This is done by examining data based on economic values as well as reviewing research on social benefits of urban trees.

SOCIAL STUDIES E.12.16*The Behavioral Sciences: Individuals, Institutions, and Society*

Standard is: Identify and analyze factors that influence a person’s mental health.

Students review research article summaries about how trees and green space impact the social health of people and their communities. They discuss these articles in small groups.

LESSON 2: WORKING TOGETHER**AGRICULTURE C.12.2***Leadership*

Standard is: Practice skills relating to communication, problem-solving, and decision making through individual, group, and team processes.

Students participate in a group activity where they must propose solutions to problems in a landscape and work with others who have different goals to come to a consensus about issues.

LANGUAGE ARTS B.12.2*Writing*

Standard is: Plan, revise, edit, and publish clear and effective writing.

- Write essays demonstrating the capacity to communicate knowledge, opinions, and insights to an intended audience through a clear thesis and effective organization of supporting ideas.
- Given a writing assignment to be completed in a limited amount of time, produce a well developed, well organized, clearly written response in effective language and a voice appropriate for audience and purpose.

Students write a short paper for the conclusion activity. In the paper, they are asked to consider if the conflicts they experienced during the map activity would also occur in a rural forest setting.

LANGUAGE ARTS C.12.3*Oral Language*

Standard is: Participate effectively in discussion.

- Consider the ideas and opinions of other speakers thoughtfully before responding
- Be aware of and try to control counterproductive emotional responses to a speaker or ideas conveyed in a discussion
- Perform various roles in a discussion, including leader, participant, and moderator
- Explain and advance opinions by citing evidence and referring to authoritative sources
- Employ strategies such as summarizing main ideas or identifying areas of agreement to solve problems, resolve conflicts, and conclude discussions
- Convey criticism in a respectful and supportive way

Students participate in a group activity where they must use group discussion to solve conflicts between smaller groups of “property owners” to act in the best interest of the entire group.

SOCIAL STUDIES A.12.9*Geography: People, Places, and Environments*

Standard is: Identify and analyze cultural factors, such as human needs, values, ideals, and public policies, that influence the design of places, such as an urban center, an industrial park, a public project, or a planned neighborhood.

Students discuss the effects of differing values and goals of landowners concerning urban forest management. They work together to make management decisions about the public street trees in a fictitious neighborhood.

LESSON 3: ISSUES AND ACTION**AGRICULTURE C.12.2***Leadership*

Standard is: Practice skills relating to communication, problem-solving, and decision making through individual, group, and team processes.

Students work as a team to research an urban forest issue, write a report which explains the issue and suggests solutions, and present their findings to the class orally.

ENVIRONMENTAL EDUCATION A.12.5*Questioning and Analysis*

Standard is: Communicate the results of their investigations to groups concerned with the issue.

Students present their research and the action plans about their assigned issue to the class.

ENVIRONMENTAL EDUCATION D.12.1*Decision and Action Skills*

Standard is: Identify a variety of approaches to environmental issues, evaluate the consequences of each, and select and defend a position.

Students work in groups to research an urban forest issue and create an action plan to address that issue in their community. Students evaluate and determine which action they will propose to the class, then defend that choice during their presentation.

ENVIRONMENTAL EDUCATION D.12.2*Decision and Action Skills*

Standard is: Evaluate reasons for participation or nonparticipation in an environmental activity in the home, school, or community.

The class discusses and determines which of the action plans they should pursue. To do this, the class will need to identify and evaluate the reasons people might or might not participate.

ENVIRONMENTAL EDUCATION D.12.5*Decision and Action Skills*

Standard is: Develop a plan to maintain or improve some part of the local or regional environment, and enlist support of the implementation of that plan.

Students work in groups to research an urban forest issue and create an action plan to address that issue in their community. Students present their proposed plan to the class to encourage them to join the effort.

ENVIRONMENTAL EDUCATION D.12.7*Decision and Action Skills*

Standard is: Analyze political, educational, economic, and governmental influences on environmental issues, and identify the role of citizens in policy formation.

Students research an urban forest issue and find out what groups or individuals in their community, state, and/or nation are working to address the issue and make changes to policy.

LANGUAGE ARTS C.12.1

Oral Language

Standard is: Prepare and deliver formal oral presentations appropriate to specific purposes and audiences.

- Develop and deliver a speech that conveys information and ideas in logical fashion for a selected audience, using language that clarifies and reinforces meaning
- Construct and present a coherent argument, summarizing then refuting opposing positions, and citing persuasive evidence
- Participate effectively in question-and-answer sessions following presentations
- Demonstrate confidence and poise during presentations, interacting effectively with the audience, and selecting language and gestures mindful of their effect
- Synthesize and present results of research projects, accurately summarizing and illustrating the main ideas, using appropriate technological aids, and offering support for the conclusions
- Speak fluently with varied inflection and effective eye contact, enunciating clearly at an appropriate rate and volume
- Observe the appropriate etiquette when expressing thanks and receiving praise

Students work as a team to research an urban forest issue, write a report that explains the issue and suggests solutions, and present their findings to the class orally. Presentations include summarizing their issue, making a persuasive argument as to why the class should pursue action on the issue, and answering questions in a discussion of the issue.

LANGUAGE ARTS C.12.2

Oral Language

Standard is: Listen to, discuss, and comprehend oral communications.

- Distinguish between relevant and irrelevant information
- Distinguish fact from opinion, evaluate logic, and identify manipulative techniques
- Analyze messages for their accuracy and usefulness
- Relate a speaker's ideas and information to prior knowledge and experience

Students listen to the presentations other groups give about their issues and participate in discussion of those issues.

LANGUAGE ARTS C.12.3

Oral Language

Standard is: Participate effectively in discussion.

- Detect and evaluate a speaker's bias
- Consider the ideas and opinions of other speakers thoughtfully before responding
- Evaluate the validity and adequacy of ideas, arguments, hypotheses, and evidence
- Be aware of and try to control counterproductive emotional responses to a speaker or ideas conveyed in a discussion
- Perform various roles in a discussion, including leader, participant, and moderator
- Demonstrate the ability to extend a discussion by adding relevant information or asking pertinent questions
- Explain and advance opinions by citing evidence and referring to authoritative sources
- Employ strategies such as summarizing main ideas or identifying areas of agreement to solve problems, resolve conflicts, and conclude discussions
- Convey criticism in a respectful and supportive way

Students participate in class presentations and discussion about the issues presented in each presentation. The class must discuss the issues effectively to come to consensus on one issue they would like to take action on.

LANGUAGE ARTS E.12.1*Media and Technology*

Standard is: Use computers to acquire, organize, analyze, and communicate information.

- Design, format, and produce attractive word-processed documents for various purposes
- Integrate graphics appropriately into reports, newsletters, and other documents
- Use online sources to exchange information

Students use the internet to investigate urban forest issues assigned to them. They use the information gathered to create a written plan of action.

LANGUAGE ARTS E.12.3*Media and Technology*

Standard is: Create media products appropriate to audience and purpose.

- Create multimedia presentations in connection with major projects, such as research reports or exhibitions
- Develop various media projects to inform or entertain others in school or the community, such as slide shows, videos, newspapers, sound recordings, literary publications, and brochures

Students present a summary of the urban forest issue they investigated and the solutions they suggest for the issue. Students choose a medium to use to present the information they have gathered.

SCIENCE H.12.1*Science in Social and Personal Perspectives*

Standard is: Using the science themes and knowledge of the Earth and space, life and environmental, and physical sciences, analyze the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region.

Students discuss as a class the benefits and drawbacks to each of the issue action plans presented. They will use a number of factors in determining which to choose, including the potential impact on their community.

SCIENCE H.12.6*Science in Social and Personal Perspectives*

Standard is: Evaluate data and sources of information when using scientific information to make decisions.

Students research an urban forest issue using the internet and other research materials. Students are asked to evaluate the sources of information as they research their issue.

SCIENCE H.12.7*Science in Social and Personal Perspectives*

Standard is: When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning.

Students use the information they learned in their research of an issue to formulate an action plan to address that issue.

SOCIAL STUDIES C.12.8*Political Science and Citizenship: Power, Authority, Governance, and Responsibility*

Standard is: Locate, organize, analyze, and use information from various sources to understand an issue of public concern, take a position, and communicate the position.

Students use the internet and other sources of information to research an urban forest issue. They present their findings and opinion of the action that should be taken regarding the issue to the class in an oral presentation.

SOCIAL STUDIES C.12.10*Political Science and Citizenship: Power, Authority, Governance, and Responsibility*

Standard is: Identify ways people may participate effectively in community affairs and the political process.

Students identify actions that people could take to participate in addressing an urban forest issue in their community.

WISCONSIN MODEL ACADEMIC STANDARDS K-4TH GRADE UNIT

Standard	Lesson 1	Lesson 2	Lesson 3	Lesson 4
AGRICULTURE				
E.4.1				
ENVIRONMENTAL EDUCATION				
B.4.5				
B.4.7				
C.4.1				
C.4.3				
C.4.4				
C.4.5				
D.4.3				
D.4.5				
LANGUAGE ARTS				
A.4.1				
B.4.1				
B.4.2				
C.4.1				
C.4.3				
D.4.1				
SCIENCE				
F.4.4				
SOCIAL STUDIES				
E.4.7				
VISUAL ARTS				
E.4.1				

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K-4

5-8

9-12

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WISCONSIN MODEL ACADEMIC STANDARDS 5TH-8TH GRADE UNIT

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CONCEPTUAL GUIDE

Standard	Lesson 1	Lesson 2	Lesson 3	Lesson 4
AGRICULTURE				
E.8.2				
ENVIRONMENTAL EDUCATION				
A.8.4				
A.8.5				
A.8.6				
B.8.3				
B.8.5				
B.8.8				
B.8.10				
B.8.11				
B.8.14				
D.8.5				
D.8.6				
LANGUAGE ARTS				
A.8.1				
B.8.1				
B.8.2				
C.8.1				
C.8.2				
C.8.3				
D.8.1				
E.8.1				
E.8.3				
MATHEMATICS				
A.8.1				
B.8.5				
E.8.4				
SOCIAL STUDIES				
C.8.8				
E.8.4				

WISCONSIN MODEL ACADEMIC STANDARDS 9TH-12TH GRADE UNIT

Standard	Lesson 1	Lesson 2	Lesson 3
AGRICULTURE			
C.12.2			
ENVIRONMENTAL EDUCATION			
A.12.5			
B.12.2			
B.12.12			
D.12.1			
D.12.2			
D.12.5			
D.12.7			
LANGUAGE ARTS			
B.12.2			
C.12.1			
C.12.2			
C.12.3			
E.12.1			
E.12.3			
SCIENCE			
H.12.1			
H.12.6			
H.12.7			
SOCIAL STUDIES			
A.12.9			
C.12.8			
C.12.10			
E.12.16			

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K-4

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APPENDIX

CONCEPTUAL GUIDE

SUBJECT AREAS

K-4TH GRADE SUBJECT AREAS

	ARTS	LANGUAGE ARTS	SCIENCE	SOCIAL STUDIES
LESSON 1: What's an Urban Forest?				
LESSON 2: Urban Forest Benefits				
LESSON 3: Taking Care of Urban Forests				
LESSON 4: Urban Forest Stewardship				

5TH-8TH GRADE SUBJECT AREAS

	LANGUAGE ARTS	MATHEMATICS	SCIENCE	SOCIAL STUDIES
LESSON 1: Urban Forest Connections				
LESSON 2: Urban Forest Benefits				
LESSON 3: Management Decisions and Biodiversity				
LESSON 4: Stewardship Close to Home				

9TH-12TH GRADE SUBJECT AREAS

	AGRICULTURE	ECONOMICS	LANGUAGE ARTS	SOCIAL STUDIES
LESSON 1: What's it Worth?				
LESSON 2: Working Together				
LESSON 3: Issues and Action				

MULTIPLE INTELLIGENCES

Multiple Intelligences can be thought of as different modes of learning and retaining information. Generally, everyone has all the multiple intelligences, but in varying strengths. Students excel when they have an opportunity to express themselves in their preferred intelligences, but also need to have opportunities to strengthen other areas. The tables below lists each of the LEAF lessons and the multiple intelligences that are addressed.



V-L: VERBAL-LINGUISTIC

Using language to express ideas and concepts, thinking symbolically and reasoning abstractly, and the ability to create conceptual verbal patterns.



L-M: LOGICAL-MATHEMATICAL

Skillfully able to think logically, inductively, categorically; recognize patterns; and work with abstract concepts.



V-S: VISUAL-SPATIAL

Perceiving images and spatial elements and representing those expressions effectively.



B-K: BODILY-KINESTHETIC

Creatively using the whole body to illustrate ideas and concepts.



M-R: MUSICAL-RHYTHMIC

Discriminating among musical components and using instruments or the voice to express understanding.



INTER: INTERPERSONAL

Demonstrating empathy toward or appreciating the thoughts and feelings of others.



INTRA: INTRAPERSONAL

Analyzing one's own thoughts and motivations and expressing understanding of those thoughts and feelings through behavior.



NAT: NATURALISTIC

Sensing patterns in and making connections with nature and the environment.

K-4TH GRADE MULTIPLE INTELLIGENCES

	Verbal-Linguistic	Logical-Mathematical	Visual-Spatial	Bodily-Kinesthetic	Musical-Rhythmic	Interpersonal	Intrapersonal	Naturalistic
Lesson 1								
Lesson 2								
Lesson 3								
Lesson 4								

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5TH-8TH GRADE MULTIPLE INTELLIGENCES

	Verbal-Linguistic	Logical-Mathematical	Visual-Spatial	Bodily-Kinesthetic	Musical-Rhythmic	Interpersonal	Intrapersonal	Naturalistic
Lesson 1								
Lesson 2								
Lesson 3								
Lesson 4								

9TH-12TH GRADE MULTIPLE INTELLIGENCES

	Verbal-Linguistic	Logical-Mathematical	Visual-Spatial	Bodily-Kinesthetic	Musical-Rhythmic	Interpersonal	Intrapersonal	Naturalistic
Lesson 1								
Lesson 2								
Lesson 3								

LESSON CONNECTIONS TO THE LEAF CONCEPTUAL GUIDE TO K-12 URBAN FOREST EDUCATION IN WISCONSIN

The objectives of each lesson in the *Wisconsin K-12 Urban Forest Lesson Guide* are based on subconcepts outlined in the publication *LEAF Conceptual Guide to K-12 Urban Forest Education in Wisconsin*. This chart identifies the subconcepts covered by each lesson.

K-4TH GRADE LESSON CONNECTIONS

Sub-concept	Theme 1: What Is An Urban Forest?					Theme 2: Why Are They Important?					Theme 3: How Do We Sustain Them?					Theme 4: What Is the Future?									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Lesson 1																									
Lesson 2																									
Lesson 3																									
Lesson 4																									

5TH-8TH GRADE LESSON CONNECTIONS

Sub-concept	Theme 1: What Is An Urban Forest?					Theme 2: Why Are They Important?					Theme 3: How Do We Sustain Them?					Theme 4: What Is the Future?									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Lesson 1																									
Lesson 2																									
Lesson 3																									
Lesson 4																									

9TH-12TH GRADE LESSON CONNECTIONS

Sub-concept	Theme 1: What Is An Urban Forest?					Theme 2: Why Are They Important?					Theme 3: How Do We Sustain Them?					Theme 4: What Is the Future?									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Lesson 1																									
Lesson 2																									
Lesson 3																									

LEAF WISCONSIN K-12 FORESTRY EDUCATION LESSON GUIDE OVERVIEWS

This *LEAF Wisconsin K-12 Urban Forest Lesson Guide* is a supplement to the *LEAF Wisconsin K-12 Forestry Education Lesson Guide (LEAF Guide)*.

The *LEAF Guide* teaches about general topics. It is comprised of six grade-specific units: K-1, 2-3, 4, 5-6, 7-8, 9-12. The *LEAF Guide* is obtained by participating in a *LEAF* workshop.

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.

LEAF WISCONSIN K-12 FORESTRY EDUCATION LESSON GUIDE OVERVIEWS

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.

LEAF WISCONSIN K-12 FORESTRY EDUCATION LESSON GUIDE OVERVIEWS

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.

LEAF WISCONSIN K-12 FORESTRY EDUCATION LESSON GUIDE OVERVIEWS

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.

LEAF WISCONSIN K-12 FORESTRY EDUCATION LESSON GUIDE OVERVIEWS

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.

