Teacher's Guide

INTO THE FOREST

Oregon Forest
Resources Institute

CONTENTS

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WHAT IS OFRI?

The Oregon Forest Resources Institute is a state agency whose mission is to advance public understanding of how forest stewardship meets the social, environmental and economic needs of both present and future generations. OFRI works closely with the scientific, academic and educational communities at Oregon State University, the Oregon Department of Forestry and other agencies to ensure its K-12 resources are accurate and objective.

ABOUT *INTO THE FOREST*

Into the Forest is an informational text that introduces students to Oregon forests. Through engaging graphics and age-appropriate language, it helps students understand the basics of the forest ecosystem, forest products and careers, and forest management in Oregon. It also includes student questions and activities to enhance student engagement and learning. *Into the Forest* was reviewed by educators for readability and usability.

Why teach about Oregon forests?

All life, including our own, depends on forests. Forests help filter fresh water, supply oxygen, modulate temperatures and rainfall, provide habitat for diverse animal and plant species, and store atmospheric carbon. In Oregon, nearly 50 percent of our state's 61 million acres is forestland. Our forests supply renewable resources for lumber, paper and heating, along with jobs that support families and communities. They also provide us with places for recreation and relaxation.

As we continue to depend on forests in many different ways, Oregonians must play an active role in ensuring the long-term sustainability of our forests. To do this, our students need the knowledge and skills to make decisions and understand the impacts of their choices. They need to understand not only how forests work, but also how people are connected to them ecologically, economically and socially.

Studies have found that direct experiences in nature – with students actively involved in their own learning – can improve students' overall academic performance, self-esteem, community involvement and personal health. Young people in Oregon, as in other parts of the United States, are spending more time indoors and less time connecting with nature. Now more than ever, we must find ways to engage them with the natural world. A good place to start is with the forests in Oregon's own backyard.

How to use this guide

This teacher's guide suggests a variety of ways to use *Into the Forest* with your students. It explores six major themes presented in the book, and offers discussion questions, classroom activities and resources to deepen your students' understanding of Oregon forests.

Both *Into the Forest* and this guide are designed to be flexible. You may use them in your science, English language arts or social studies courses, or in coordination with an Outdoor School program.

You may opt to have students read the student book one section at a time, and then do the class activity associated with a particular section. Or you may have the class read the book as a whole over a couple days, and choose the activities from this guide that best fit your course goals.

In addition to the class activities suggested in this guide, the *Into the Forest* student book includes individual student activities sprinkled throughout its pages. Depending on your objectives, you may encourage students to do these activities on their own, or assign them as homework or as group activities in class.

Note: Before having students read the book (or sections of it), ask them to think about why people should care about Oregon forests.

Relevant education standards

The *Into the Forest* student book and the activities in this guide address the following education standards.

	Student Book	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6
Next Generation Science Standards							
Performance Expectations							
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystems services.						X	
MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.			X		X		
Disciplinary Core Ideas							
ESS3.A. Humans depend on Earth's land, ocean, atmosphere, and biosphere for different resources, many of which are limited or not renewable.	X		X	X			X
LS1.C. Plants use the energy from light to make sugars through photosynthesis.	X		X				
LS2.A. Organisms and populations are dependent on their environmental interactions both with other living things and with nonliving factors, any of which can limit their growth.	X				X	X	
LS2.B. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.	X		X				
Science and Engineering Practices							
2. Developing and using models.			X		X		
3. Planning and carrying out investigations.		X					
4. Analyzing and interpreting data.		X					
6. Constructing explanations and designing solutions.						X	X
8. Obtaining, evaluating, and communicating information.		X		X			X
Common Core State Standards – English Language Arts							
RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.	X						
W.6.7. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.		X		X	X		
Oregon Social Science Academic Content Standards							
Geography 6.11. Distinguish among different types of maps and use them to analyze an issue in the Western Hemisphere.		X					
Social Science Analysis 6.21. Clarify key aspects of an event, issue, or problem through inquiry and research.				X			

WHAT AND WHERE ARE OREGON FORESTS?

Theme 1

Notes for the teacher

Oregon forests are an important part of our state's environment and economy. Nearly half of Oregon's land — 48.4 percent — is covered by forest. Forests thrive in many different regions of the state, including the Coast Range, around the edges of the Willamette Valley, the Cascades, the Klamath Mountains and the Blue Mountains. Which forest type dominates a region depends on climate, elevation, wind and rainfall, temperature and soil conditions.

Conifers, or cone-bearing trees, are prevalent in Oregon forests. These trees have needle- or scale-like leaves and bear seeds inside woody cones. Most conifers are evergreen.

Trees that are not conifers are called broadleaf trees, because their leaves are flat and relatively wide. Oaks, maples and other Oregon broadleafs are mostly deciduous, which means they lose all their leaves in the autumn and remain bare through the winter months until spring, when they grow new foliage. These are also called hardwoods.

For the activity, choose an area on or near your school campus that has several different conifers for students to identify. If you will be using the "Identifying Oregon's trees" student page, either copy it into 11" x 17" sheets or use standard-sized sheets and tape the two sides together.

Key points from *Into the Forest*

- A forest is a large area of land covered by trees (page 3).
- Almost half of Oregon is forest (page 2).
- Oregon's forests are made up of different types of trees, depending on their location (pages 8–9).

Discussion questions

- What is a forest?
- Why do different types of trees grow in different areas of Oregon?
- How can we tell one type of tree from another?

Recommended forest literacy reading

Urban forests are another type of forest that is important for Oregon communities. Introduce students to the concept of urban forests by having them read "Fun with Trees and People: Working in a City Forest" (available from the OFRI website – see Resources on page 19).

Class activity: Tree ID

Students learn how to identify trees at or near their school, and research the trees' growing requirements.

MATERIALS

- Forests of Oregon Poster* (or access to Forest Types interactive map on OFRI website) or *Forest Fact Break: Forest Types** video
- "Identifying Oregon's trees" student page, "Trees of Oregon's Forests" (OFRI's online tree guide at oregonforests.org/content/tree-variety)* or other tree identification guide

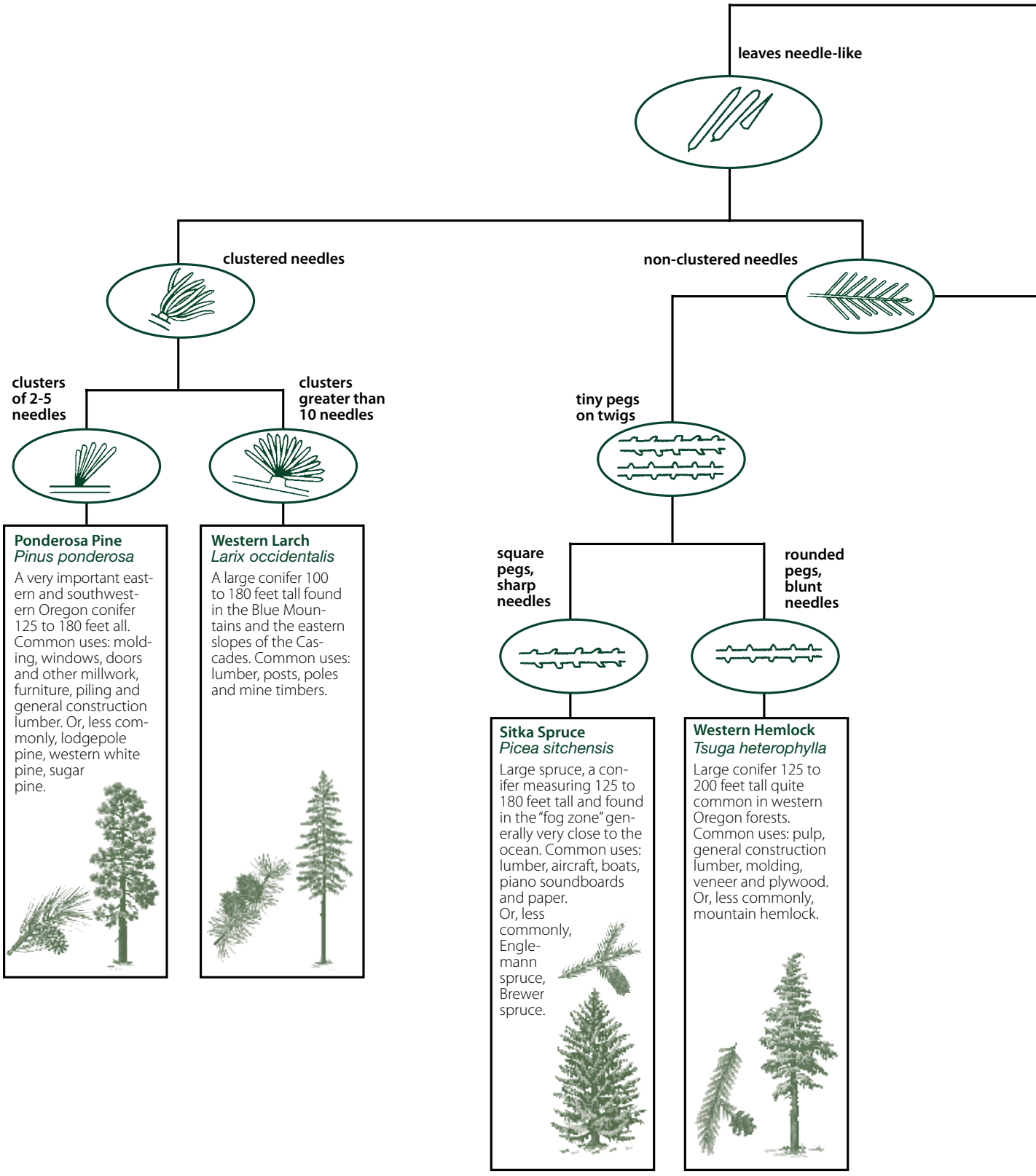
DOING THE ACTIVITY

1. Show students the "Forests of Oregon" poster or view the *Forest Fact Break: Forest Types* video. Discuss where Oregon forests are located and the types of forests common in your region.
2. Take students to the treed area you have chosen (see "Notes for the teacher"), and give each pair or small group a copy of the "Identifying Oregon's trees" student page or other tree guide.
3. Help students identify the trees by looking carefully at their leaves, needles and buds.
4. Back in class, invite students to choose one of the trees and research that tree's requirements for rainfall, temperature and soil conditions.

**Available from the LearnForests.org website – see Resources on page 19.*

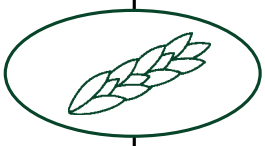
Identifying Oregon's trees

The two main types of trees in Oregon forests are conifers and hardwoods. Although there are actually more hardwood species (35) than conifer (30), conifers dominate Oregon forests. Conifers have needle- or scale-like leaves and bear seeds inside woody cones. Hardwoods are mostly broad-leaved and their seeds come from their flowers.



Common Oregon CONIFER trees

leaves flattened and scale-like



Western Redcedar
Thuja plicata

Large conifer 150 to 200 feet tall found in western Oregon along river bottoms, flats and mountain slopes. Common uses: lumber for siding, interior finish, boat building, fences, poles, posts, shakes and shingles. Or, less commonly, incense cedar, white cedar, Port Orford cedar, Alaska cedar, western juniper.

no pegs on twigs

large, pointed buds

buds round and clustered

Douglas-fir
Pseudotsuga menziesii

A large conifer 100 to 250 feet tall predominant in western Oregon and common east of the Cascades, especially at mid-to-high elevations. Common uses: structural products such as lumber, beams, trusses and flooring plus veneer, plywood, paper pulp and some chemicals.

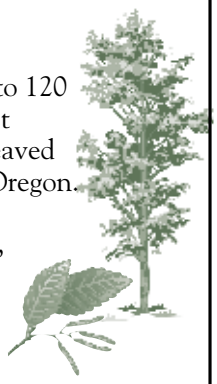
Noble Fir
Abies procera

A large conifer 150 to 200 feet tall common at middle to high elevations in the Cascade and Siskiyou mountains. Common uses: lumber, plywood, pulp for paper products and Christmas trees. Or, less commonly, white fir, grand fir, subalpine fir, Pacific silver fir, others.

Common Oregon HARDWOOD trees

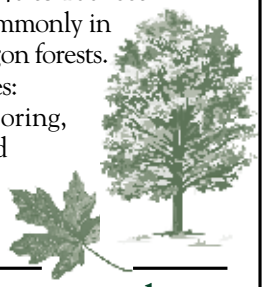
Red Alder
Alnus rubra

A hardwood 30 to 120 feet tall, the most common broadleaved tree in western Oregon. Common uses: furniture, pallets, wooden ware, plugs for paper rolls and toys.



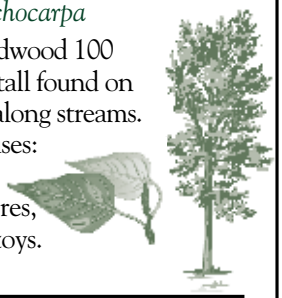
Bigleaf Maple
Acer macrophyllum

A hardwood 40 to 100 feet tall found commonly in western Oregon forests. Common uses: furniture, flooring, paneling and paintbrush handles.



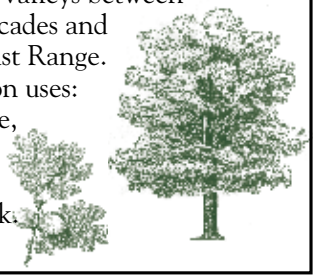
Black Cottonwood
Populus trichocarpa

A large hardwood 100 to 200 feet tall found on moist sites along streams. Common uses: paper pulp, plywood cores, crates and toys.



Oregon White Oak
Quercus garryana

A hardwood 60 to 80 feet tall most commonly found in the interior valleys between the Cascades and the Coast Range. Common uses: furniture, flooring and millwork.



Theme 2

ENVIRONMENTAL IMPORTANCE OF OREGON FORESTS

Notes for the teacher

Forests are one of Earth's major life-support systems. They supply oxygen, help filter fresh water, build soil and provide habitat for many different animals and plants. They also cycle and store carbon.

The carbon cycle is the movement of carbon in its many forms among Earth's organisms (biosphere), the gas surrounding Earth (atmosphere), water (hydrosphere), and soils and rocks (geosphere). Photosynthesis is the process whereby plants use sunlight, carbon from the atmosphere and water to make glucose and other carbohydrates. The carbohydrates are either converted to energy through the process of respiration, or stored in the plant in the form of wood.

EQUATION FOR PHOTOSYNTHESIS:

$6CO_2$	+	$6H_2O$	→	$C_6H_{12}O_6$	+	$6O_2$
(carbon dioxide)		(water)	(with sunlight)	(glucose)		(oxygen)

Carbon sequestration is the removal and capture of atmospheric carbon in plants, soils, oceans or atmosphere. A place where carbon is sequestered is often referred to as a carbon sink. Trees in forests, as well as forest products, are primary carbon sinks. Unlike other building materials such as concrete and steel, wood is a carbon sink. Approximately 50 percent of the dry weight of wood is carbon.

Key points from *Into the Forest*

- Forests supply oxygen that humans and other animals breathe (page 4).
- Forests make clean water and help control flooding (page 4).
- Forests take in carbon dioxide from the atmosphere and, through photosynthesis, turn the carbon into wood and release oxygen (page 4).

Discussion questions

- An ecosystem service is something an ecosystem does that benefits humans. What ecosystem services do forests provide?
- Where do trees get the carbon dioxide they need to grow?
- In what ways do forests help reduce the effect of climate change?

Recommended forest literacy readings

To explore other environmental services forests provide, have students read "Water Journeys from Forest to Faucet" or "Learning about Worms from the Inside Out" (available from the OFRI website – see Resources on page 19).

Class activity: Carbon cycle

Students explore the value of forests in cycling and storing carbon, and create a model showing carbon sinks and sources.

MATERIALS

- *Forest Fact Break: Carbon Capture* video*
- "Carbon Cycle" Poster*
- "Carbon cycle sinks and sources" student page

DOING THE ACTIVITY

1. Share with students the *Forest Fact Break: Carbon Capture* video and discuss how forests help store carbon.
2. Review or introduce the concept of photosynthesis using the information and equation included in the "Notes for the teacher."
3. Divide the class into small groups, giving each a copy of the "Carbon Cycle" Poster (or electronic access to it), and a copy of the "Carbon cycle sinks and sources" student page.
4. Have students look for places in the cycle where carbon is stored (sinks) and where it is released (sources). They can record those and other sinks and sources on the student page.
5. Challenge students to use the information on the student page to create their own model or diagram showing carbon sinks and sources.

**Available from the OFRI website – see Resources on page 19.*

Carbon cycle sinks and sources

Work with a partner to identify carbon sinks and carbon sources.
For each sink, describe how carbon enters it. For each source, describe how it is emitted.

Carbon sink	How does it get there?	Carbon source	How is it emitted?

Trees can be both a carbon sink and a carbon source. Can you explain why? _____

_____

_____

Theme 3

ECONOMIC AND SOCIAL IMPORTANCE OF OREGON FORESTS

Notes for the teacher

Oregon's forests supply renewable resources for lumber, paper and heating, along with jobs that support families and communities. They also provide residents with places to play, hike, camp and connect with nature.

Oregon's forest sector is one of the state's largest economic sectors. It represents about 60,000 jobs, which include managing forests, harvesting trees and turning trees into a wide range of products. It also includes careers in forestry, science and engineering, trucking and equipment, manufacturing, energy, recreation, government and forest support.

Find Your Path is a career series produced by OFRI that includes a number of short videos, each highlighting a particular forest career from the voice and perspective of a real person in that career. The series also includes a booklet that explores a variety of careers in the forestry sector. (While aimed at high school students, the booklet is also suitable for sixth-graders.)

Key points from *Into the Forest*

- For thousands of years, forests have helped shape the economic, social and cultural composition of local human communities (page 6).
- We continue to rely on forests for a variety of products and jobs (pages 6-7).
- Trees are a renewable resource (page 6).
- Of every 30 workers in Oregon, one has a job directly related to forests (page 22).

Discussion questions

- In what ways do forests help Oregon's economy?
- What social benefits do forests provide for communities or individuals?
- What careers are related to Oregon forests?

Recommended forest literacy reading

To explore other aspects of the economic and social importance of Oregon forests, have students read: "Not Just a Pretty Face: The Useful Sitka Spruce Tree" or "Man Finds Hoary Bat, Becomes a Bat Man" (available from the OFRI website – see Resources on page 19).

Class activity: Forest careers

Students learn about forest-related careers in Oregon and research one that interests them.

MATERIALS

- *Find Your Path* videos*
- *Find Your Path* booklet* (optional)
- "Find your path" student page

DOING THE ACTIVITY

1. Choose two or more *Find Your Path* videos to share with students. Discuss each person's job, as well as the education, skills, experience and personal attributes required for the job.
2. Give students a copy of the "Find your path" student page. Have them choose a forest-related career to research – either one listed on the bottom of the page or one they think of on their own.
3. Provide copies of the *Find Your Path* booklet (optional) and access to the Internet for their research.
4. Ask students to share what they learned with others in the class.
5. You might also invite someone from the forest sector to speak to your class about his or her job.

**Available from the OFRI website – see Resources on page 19.*

Find your path

Choose a forest-related career, either from the list below or another that interests you. Find out what education, skills, experience and personal interests or strengths are required. Then write a paragraph telling whether that career appeals to you and why (or why not).

Career title: _____

Job description: _____

Education: _____

Skills: _____

Experience: _____

Personal interests or strengths: _____

Does this career appeal to you? Explain why or why not. _____

Some forest-related careers

- Forest Engineer
- Forest Manager
- Log Truck Driver
- Logging Crew
- Mill Operator
- Natural Resource Ecologist
- Nursery Manager
- Recreation Unit Manager
- Wildland Firefighter
- Wildlife Biologist

THE FOREST ECOSYSTEM

Notes for the teacher

A forest ecosystem is comprised of biotic (living) and abiotic (nonliving) factors interacting within a given environment, space and time. It consists of different types of organisms – such as producers, consumers and decomposers – that are interconnected with one another and with their environment.

Forest ecosystems are complex and dynamic. They continuously undergo change or adaptation, ranging from gradual change (such as succession, or the replacement of a young forest by an older forest) to abrupt change (such as wind, fire, insects, disease and logging). Natural and human-caused events are a critical part of a forest ecosystem, leading to a forest's renewal and adding to forest diversity. Examples of natural events include wind and volcanic activity, and examples of human-caused events include logging, road construction and development.

The animals that live in a particular forest depend, in part, on the age of the forest. Some animals prefer young forest stands, while others prefer middle-aged or older stands, and still others move from one type to another. Their preferences vary based on their needs for foraging, breeding, rearing young, sleeping or escaping predators. Having forests of different ages ensures diversity of wildlife habitat.

For the activity, students research different forest animals, and then use the information to create a food web showing how the animals are connected. You may have them choose one of the following forest animals or another that interests them. Alternatively, have students draw the names of animals at random.

Young Forests	**Middle-Aged Forests**	**Older Forests**
American goldfinch	Black-tailed deer	Black-tailed deer
Badger	Bobcat	Cooper's hawk
Black-tailed deer	Common garter snake	Hoary bat
Chipping sparrow	Cougar	Marbled murrelet
Common nighthawk	Coyote	Northern flying squirrel
Deer mouse	Douglas squirrel	Northern spotted owl
Mountain beaver	Ensatina salamander	Pileated woodpecker
Northern pocket gopher	Raccoon	Red tree vole
Striped skunk	Roosevelt elk	Vaux's swift
Western bluebird		

Key points from *Into the Forest*

- A forest is an ecosystem with many different living and nonliving components connected to each other (pages 10-11).
- If one thing changes in an ecosystem, other things will be affected (page 19).
- Forest ecosystems are always changing (page 19).

Discussion questions

- Besides trees, what makes up a forest ecosystem?
- How are forest ecosystems the same as or different from other ecosystems?
- What are some of the ways the living (biotic) and nonliving (abiotic) components of an ecosystem interact?
- What factors cause forests to change over time?

Recommended forest literacy readings

To explore additional aspects of the forest ecosystem, have students read one or more of the following: "Life at the Top," "Freed by Fire: Lodgepole Pines Rise from the Ashes" or "Nature's Engineer Builds Homes and Habitat" (available from the OFRI website – see Resources on page 19).

Class activity: Forest web

Students examine the interconnectedness in a forest ecosystem by researching different forest animals and creating a food web to show feeding relationships.

MATERIALS

- *Forest Fact Break: Wildlife* or *Forest Fact Break: Ecosystems* videos*
- "Forest animal research" student page
- *Guide to Priority Plant and Animal Species in Oregon Forests** (optional)
- Chart or butcher paper
- 3" x 5" index cards
- Colored chart tape

DOING THE ACTIVITY

1. Share the *Forest Fact Break: Wildlife* or *Forest Fact Break: Ecosystems* video with your students, and discuss what students learned about forests ecosystems from the video.
2. Give students copies of the "Forest animal research" student page. Assign or have students choose a forest animal and use a variety of resources to complete the student page. (For example, they may use the *Guide to Priority Plant and Animal Species in Oregon Forests*, which you may order from the OFRI website.)
3. After students have had time for their research, invite them to use the information to make an Animal Card using an index card. The card should have an illustration of the animal, common name and scientific name on the front, and diet and principal predators and the forest-stand age it prefers on the back.
4. Use the wildlife cards to create an Oregon forest food web on butcher paper or on a bulletin board. (If you choose, you may create different food webs to represent young, middle-aged and older forest stands.) Students should attach their Animal Cards, and then use colored chart tape to make a line between their animal and animals it eats or that feed on it. If necessary, have students make additional cards for specific plants, insects or other food items to complete the web.

**Available from the OFRI website – see Resources on page 19.*

Forest animal research

Learn about a forest animal. Using resource materials, answer the following about your animal.

Name of animal: _____

Photo or illustration of animal:

Scientific name: _____

Description: _____

_____

Range: _____

Diet: _____

Habitat: _____

_____

Forest type/age: _____

Principal predator/threats: _____

Reproduction: _____

_____

Interesting fact: _____

_____

FOREST MANAGEMENT

Theme 5

Notes for the teacher

Most forests need some form of management to ensure their health and sustainability. However, not all forests are managed in the same way. Forests in Oregon generally fall into one of three management classifications:

- Reserve – managed primarily for environmental attributes, such as old-growth habitat.
- Multi-resource – managed for multiple uses, including recreation, water, wildlife habitat and some timber production.
- Wood production – managed primarily for sustainable timber production, while protecting water quality and habitat.

Forest management may include planting, thinning, prescribed burning, harvesting and replanting. In Oregon, foresters and forest landowners often have a written plan that specifically addresses their forest management objectives regarding the well-being of wildlife, quality of watersheds, health of the trees and plants, and reduction of fires, insect infestations and diseases.

Forest management helps balance a forest's environmental, social and economic values – protecting the environment while providing the wood products and recreational access our society desires.

Key points from *Into the Forest*

- Forest management means doing things on purpose that affect the forest (page 20).
- Forest managers and forest landowners may, for example, plant, thin, harvest and replant trees to get wood and protect the forest ecosystem (page 21).
- The decisions a forest manager makes often depends on who owns the forest (page 21).

Discussion questions

- What do we mean by the term "forest management"?
- What kinds of things do forest managers do?
- What are some of the different reasons people manage forests? Should all forests be managed?

Recommended forest literacy reading

To learn more about the specifics of managing forests, have students read "Putting Dead Trees Back Where They Belong" (available from the OFRI website – see Resources on page 19).

Class activity: Forest plan

Students imagine they are forest managers, and make recommendations for what they would do to meet particular goals for their forest.

MATERIALS

- *Forest Fact Break: Forest Management* video* (optional)
- "Your forest plan" student page

DOING THE ACTIVITY

1. Discuss some of the ways people manage forests, as described in the student book. If you like, you may also show students the *Forest Fact Break: Forest Management* video.
2. Ask students some goals people might have for forests and create a list on the board. (Possibilities include producing wood, protecting watersheds, creating wildlife habitat, providing recreation, setting aside forest reserves and storing carbon.)
3. Divide the class into small groups and give each group one of the goals on the list from step 2. Their job will be to identify how they might manage a 100-acre forest based on their goal.
4. Give each group a copy of the student page and allow time for them to work through the questions.
5. Have groups share their suggestions for managing the forest based on their goal. As a class, compare the various management strategies. Discuss:
   - How does forest management differ depending on the goal for a particular forest?
   - Is there an activity or outcome that all forest management goals share?
   - Are there any scenarios for which the best forest management strategy is to do nothing?

**Available from the OFRI website – see Resources on page 19.*

Your forest plan

Imagine that your group owns and manages 100 acres of forest. This forest is made up of conifer trees that are all about the same age, and has a stream running through it.

What is your goal for this forest? _____

_____

What would your forest look like if your goal is being met? Draw a picture of it.

Are there any natural benefits forests provide, such as storing carbon, that could help you achieve your goal?
(Look through *Into the Forest* for ideas.) _____

_____

What forest management activities would you do in the next year to move toward your goal? _____

_____

What would you do in the following five years? _____

_____

_____

What would you do to ensure that your forest remains healthy for the next 25 years and more, while also meeting your goal?

_____

_____

OUR RESPONSIBILITY TO OREGON FORESTS

Theme 6

Notes for the teacher

We all depend on healthy and productive forests for the many services and products they provide. Everyone has a responsibility to treat forests with respect and to become a conscientious steward of Oregon's forests and forest resources.

We use the term "sustainable" to talk about forests and other resources that are used or managed in such a way that they are not depleted or permanently damaged. The Oregon Forest Practices Act helps ensure that our forests are sustainable. It outlines rules for forest management such as planting young trees as soon as possible after harvest, protecting water quality and fish habitat, and being mindful of wildlife habitat and protected areas.

There are many opportunities for young people to experience and connect with forests in Oregon. See *K-12 Forest Education Opportunities*, available on the OFRI website, for a guide to a variety of forest programs available to teachers and students (see Resources on page 19).

In addition, individuals can play a part in sustaining our forests by volunteering for projects in and around forests, becoming informed and active voters, attending public meetings and making wise consumer choices. Maintaining sustainable forests requires citizen engagement and creative problem-solving, as well as technical expertise.

Key points from *Into the Forest*

- Oregon has many rules for protecting and using our forests (page 23).
- Finding the right balance of all the things forests provide sometimes involves critical debate and active problem-solving (page 23).
- There are many things individuals can do to help ensure the sustainability of our forests (page 23).

Discussion questions

- What does "sustainable" mean?
- What are some characteristics of a sustainable forest?
- What can individuals do to help ensure the sustainability of our forests?

Recommended forest literacy reading

For a case study on a student-led project, have students read "High School Students Become Experts on Flying Squirrels" (available from the OFRI website – see Resources on page 19).

Class activity: "Caring for the Forest" game

Students create a board game that highlights things people can do to care for Oregon forests.

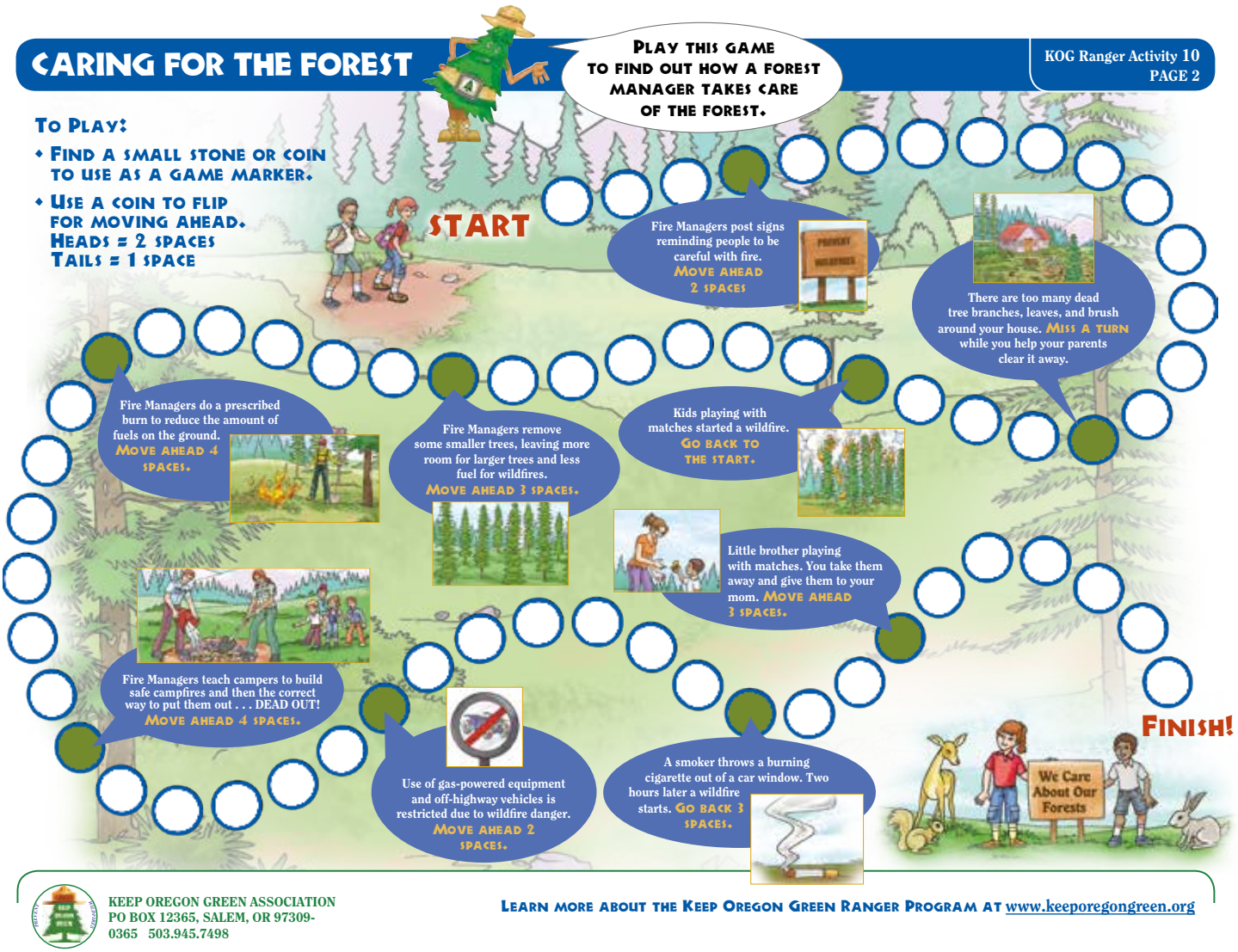
MATERIALS

- Poster board
- Marking pens
- Dice, tokens or other materials for making and playing the game

DOING THE ACTIVITY

1. Starting with the ideas in the *Into the Forest* student book, discuss ways students and other community members can help forests, including staying on designated trails, picking up litter, putting out campfires, planting a tree, using forest products wisely and so on. On the board, create a class list of their ideas. You might also help them make a separate list of things people do that might harm forests.
2. Invite students to design a board game that highlights actions people can take to help Oregon forests. Encourage them to think of a board game they know and to follow that format for their game. For example, they might make a game similar to Candyland – as in the example on page 18 – that has a trail of stepping stones through the forest. In this example, when you land on a particular stepping stone there may be an action that moves you a few spaces toward the finish (if the action helps the forest), or sets you back a few spaces (if it harms the forest).
3. Have students share their board game with fellow students or younger classes.

Example board game



Source: Keep Oregon Green Forest Ranger Program, Activity 10. http://www.kogranger.org/pdf/activities/KOG_activity10.pdf.

Resources

The following OFRI resources may be used to enhance your study of Oregon forests. They are available for order or download from **LearnForests.org.**

A TEACHER'S SAMPLER PACKET

The teacher's sampler is a great way to receive an overview of OFRI's K-12 education programs and materials. It includes all the following print resources, plus a few more.

CARBON CYCLE POSTER

This classroom poster illustrates the role of forests in the carbon cycle.

FIND YOUR PATH

This 24-page publication looks at the wide range of employment opportunities available in Oregon's forest sector. Accompanying videos (available on the OFRI website) highlight particular forest careers from the voice and perspective of a real person in that career.

FOREST FACT BREAKS

These two-minute videos simplify complex topics into fun, educational and engaging quick-takes that bring each topic to life. Topics include Carbon Capture, Clearcutting, Ecosystems, Fire Safety, Forest Fire, Forest Management, Forest Types in Oregon, Green Building, Photosynthesis, Reforestation, Sustainability, Tree Biology, Water, Wildlife and Wood Products.

FOREST LITERACY READINGS

This collection of leveled readings supports literacy skills and also teaches important Oregon science and social science topics. Each one-page essay tackles a subject related to Oregon's vast and critically important forests, and includes multiple-choice and short-answer questions to gauge comprehension.

FORESTS OF OREGON POSTER

This colorful 24" x 36" poster includes a map showing where the most common conifer and hardwood tree species are found, plus photos of each species and descriptions of the conditions in which it thrives.

GUIDE TO PRIORITY PLANT AND ANIMAL SPECIES IN OREGON FORESTS

This publication describes the specific habitat requirements of selected species found in forested habitats across all ecoregions in Oregon, and can be used to help students learn more about wildlife species and forest habitats.

K-12 FOREST EDUCATION OPPORTUNITIES

This directory highlights field sites, special events and ongoing forestry programs for Oregon educators and their students.

OREGON FOREST LITERACY PROGRAM

This forest education conceptual framework and scope and sequence offers guidance to formal and non-formal educators for developing curricula and classroom lessons related to forests. It includes examples of service-learning projects that connect to Oregon forests.

OREGON FOREST FACTS AND FIGURES

This pocket-size reference is loaded with charts, graphics and numbers illustrating the magnitude and importance of Oregon's public and private forest resources.

TREES OF OREGON'S FORESTS

This online tree guide can be viewed at http://oregonforests.org/content/tree-variety.

Glossary

The following terms include all those listed in "Words to Know" in the student book, as well as a few additional ones.

Abiotic – a nonliving factor or element in the environment; e.g., light, water, heat, rock and gases. PLT

Biotic – an environmental factor related to or produced by living organisms. PLT

Broadleaf – describes a plant with wide-bladed leaves, such as an oak or maple. PLT

Canopy – the forest layer formed by the leaves and branches of trees or shrubs. There may be several canopy layers in a given forest stand. PLT

Carbon sequestration – the long-term storage of carbon in trees and other organisms, as well as in soil and oceans.

Conifer – a plant that bears its seeds in cones. Usually refers to needle-leaf trees. PLT

Consumer – an organism that obtains energy by feeding on other organisms and their remains. PLT

Deciduous – describes a plant that periodically (typically in autumn) loses all its leaves. Most North American broadleaf trees are deciduous. A few conifers, such as the larch and cypress, are also deciduous. PLT

Decomposer – a plant or organism that feeds on dead material and causes its mechanical or chemical breakdown. PLT

Disturbance – a forceful event that brings great change to an ecosystem, often very quickly – a wildfire or windstorm, for instance.

Ecosystem – the interacting system of a biological community and its nonliving environment; also, the place where these interactions occur. PLT

Ecosystem service – a function of forests and other healthy ecosystems that benefits living organisms, such as purifying air and water, maintaining biodiversity, decomposing wastes, generating soil and pollinating plants.

Forest – a large area of land primarily covered with trees, as well as the other organisms, soil, water and air associated with them. Or an ecosystem characterized by a dominance of tree cover and the presence of a wide variety of other organisms (i.e., other plants and animals). PLT

Forest management – the practical application of scientific, economic and social principles to the administration of a forest. PLT

Forest product – any item or material derived from forests for commercial use; examples include lumber, paper, mushrooms and forage for livestock.

Habitat – an area that provides an animal or plant with adequate food, water, shelter and living space in a suitable arrangement. PLT

Natural resource – raw materials supplied by Earth and its processes. Natural resources include nutrients, minerals, water, plants, animals, etc. PLT

Photosynthesis – the process by which green plants manufacture simple sugars in the presence of sunlight, carbon dioxide and water. PLT

Producer – a living thing in an ecosystem that makes its own food using the sun.

Renewable resource – a naturally occurring raw material or form of energy that has the capacity to replenish itself through ecological cycles and sound management practices. PLT

Snag – a dead tree that is still standing.

Succession – the gradual replacement of one living community with another.

Tree – a woody perennial plant usually 12 feet or more (4 meters or more) tall, with a single main stem and a more or less distinct crown of leaves. PLT

Understory – the layer of plants growing beneath the main canopy of the forest.