Grade 4

Trees and People: Depending on Each Other

Objectives

Students will:

- list ways in which humans depend on forest products and forests depend on wise human decisions;
- describe how trees are a renewable resource.

Vocabulary Words

interdependent	renewable resource
products	seed orchards
economy	coniferous (needleleaf)
consumer demand	deciduous (broadleaf)

Background Information

Have you ever thought of yourself as **interdependent** with trees? Probably not. Yet, humans depend on trees in many ways—and trees depend on humans, too. The forest industry is much like every other industry based on a major natural resource. It gives us **products** and materials that are important to our country's **economy** and to the lives of our people. But how can we be sure we will always have a supply of those important things? We help the forest and the forest helps us. That's where wise management of the forest comes in.

People who manage forests must always keep in mind the **consumer demand** for products and services. Government studies say the demand for paper and wood products will double between the 1990s and 2030. Lucky for us, trees are a **renewable resource.** That means we can plant more trees to replace the trees we use.

The forest industry, the U.S. government, and our Minnesota state government are working together to protect and manage our trees. We're making steady progress in growing better trees—faster growing, straighter, more disease and pollution resistant. The goal is to grow more timber and make it the best quality we can. At the same time, we need to make sure there are more and better trees for future generations to use and enjoy.

Seed orchards, where improved seed is produced, are helping us grow more timber. Seed orchards in Minnesota are producing trees that will grow up to 15 percent faster than the seeds used now.

An example of industry and government working together to manage trees is Stora-Enso Industries (formerly Lake Superior Paper). Opened in 1988, this leader in nonpolluting papermaking is located on 92 acres in Duluth. In one year it produces 230,000 tons of paper. But that requires 45 truckloads of spruce and balsam trees each day. Before the plant was built, the company needed to know for sure there would always be enough balsam and spruce to make its paper. Through good forest management and planting, it is now able to depend on a steady flow of those trees in coming years. Trees are necessary not only to make the paper, but also to fuel the power that makes the plant's electricity. Each year, the plant uses the amount of wood equal to a woodpile 4 feet wide and 4 feet high running from International Falls south to the Iowa border!

In every grade level of this book, you'll find information about how people depend on trees. Former President George Bush, Sr., in a speech in Sioux Falls, South Dakota (September 1989), called trees "the oldest, cheapest, most efficient air purifi-

ers on Earth." They give us oxygen, shade, beauty, protection against wind and erosion, and food and homes for wildlife. They provide fuel, food, wood products, mulch for gardens, and chips for walking paths. They quiet a highway's noise with living snow fences, and much more.

Our job is to help trees grow healthy and strong, to protect them against disease, injury, and too much cutting. When we do our job well, we enjoy all the benefits of trees—and trees benefit too.

Minnesota Trees

Minnesota's rich soils and variety of climate provide an ideal home to many different kinds of trees and plants. (See "Minnesota Biomes Map," Resources, page 108.)

Minnesota tree types are either **coniferous (needleleaf)** or **deciduous (broadleaf).** Coniferous trees (also called conifers), bear their seeds in cones and have thin, needlelike leaves. They shed only a portion of their needles each year and people in the wood products industry often refer to them as softwoods. Our conifers include white pine, jack pine, red pine, balsam fir, black spruce, white spruce, red cedar, and white cedar.

Deciduous or broadleaf trees have covered seeds and drop their leaves each autumn. These trees are sometimes referred to as hardwoods, even though their wood is not necessarily harder than that of the softwoods. Our deciduous trees include elm, oak, aspen, cottonwood, birch, basswood, ash, and maple.

FUN FACT

Something Different

Minnesota has one obvious exception to the "rule" that conifers are evergreens. The tamarack, found in the sprawling peat bogs of the north, bears its seeds in cones but also turns golden and sheds all of its needles in the fall.

Both coniferous and deciduous trees are important for all the things they provide for humans, animals, and the environment.

Trees: A Renewable Resource

What does it mean to be a "renewable resource"? To renew means to begin again, to restore or revive. A resource is something that is a source of help or of value. Resources can give us things we need, or they can be sold to bring us money.

Trees are a renewable resource because we can use them and yet grow new ones to get more trees in the future. This is different than some of our other natural resources. Silver and gold, oil and gas, for example, are mined out of the ground. When they're gone, they're gone for good.

Renewable resources depend on people. We need to conserve and protect the trees we have now and plant a lot of new ones to keep the cycle going.

Language Arts

Literature and Folklore

Book Nook. See "Book Nook," Resources, page 135, for tree-related books.

Worth Noting

You'll need: Journals or notebooks and pencils.

Keep notes/a journal on what is learned about trees. At the end of the unit use these notes to write a story, picture book, poem, make a video or rap about trees.

Creative Writing: Haiku

You'll need: Writing paper and pencils.

Brainstorm words that can be used and list them on a white board. Then write haiku about why trees are so special in our lives. Write about what trees and forests do for you, or how they make you feel. Or, pretend you are a tree and tell about how things look from a stuck-in-one-place, tree-top point of view! What are some other ideas?

My Tree Story

Everyone has a favorite tree story. Invite students to write or tell their own favorites. Have them interview older adults and ask for favorite stories. What made these trees special? Are the trees still there? If not, why not?

Tree Pals

Choose a state in a different climate than your own. Make a contact with a school in that state. Perhaps someone has a cousin, a grandparent, a good friend who could put you in touch with a school, but if not, try telephone information or use the Internet to find "Tree Pals." Locate a class that would be willing to share "Tree Talk" with your group. Share your plans for celebrating Arbor Day. Tell about the trees in your community, and ask about the kinds of trees they have. Exchange photocopies of leaves common in each state. Discuss why different climates are needed by specific tree species.

Connecting With Business

Contact these sources. Ask what materials they can share with your class about their industries. Discuss how forest industries of tomorrow depend on replanting today.

- Minnesota Forest Industries
  903 Medical Arts Building
  324 West Superior Street
  Duluth, MN 55802
- Paper mills and lumber mills of Minnesota:

  Blandin Paper Company
  115 First Street Southwest
  Grand Rapids, MN 55744

  Boise Cascade Corporation
  Second Street & Third Avenue
  International Falls, MN 56649

  Hennepin Paper Company
  P.O. Box 90
  Little Falls, MN 56343

  Potlatch Corporation
  Northwest Paper Division
  P.O. Box 510
  Cloquet, MN 55720

Nifty Naturalists

You'll need: Resource sources, journals or notebooks, and pencils.

Sigurd Olson, John Muir, and Gifford Pinchot are names to remember when thinking about appreciating and preserving the outdoors. They knew trees and the environment need help from humans. Sigurd Olson, a Minnesotan, had a lot to do with creating our famous Boundary Waters Canoe Area Wilderness (BWCAW). John Muir's love of nature led him to persuade President Theodore Roosevelt to set aside 148 million acres of forest reserves. Muir also founded the Sierra Club, an organization that works hard to protect the environment. Gifford Pinchot was the nation's first professional forester and later, the Chief Forester of the United States. Like Muir, he too worked with President Theodore Roosevelt to bring the idea of conservation to the American people. Pinchot was one of the original founders of the Society of American Foresters.

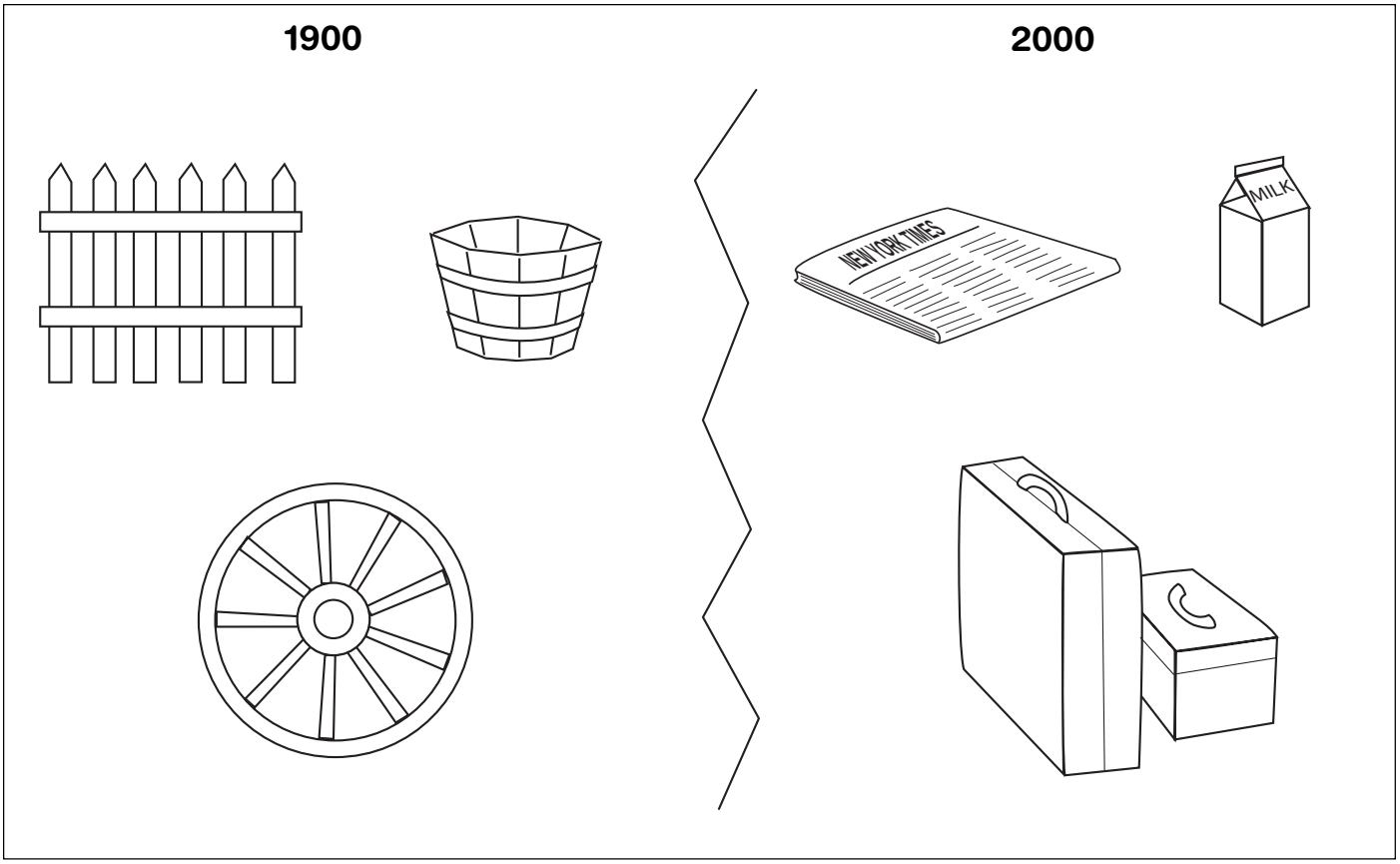
Research to learn more about these environmental pioneers. Bonus: Find out how J. Sterling Morton (the founder of Arbor Day), Rachel Carson, Aldo Leopold, and Teddy Roosevelt contributed to ecology. How does their work affect what we do today?

You and your students can be naturalists, too! Start a nature journal to write about things you would like to do to help the environment. You're sure to notice things when you take a walk, drive along the roads, or even stare out a window. What new habits or practices can you begin right away? Who can help you put your ideas into action? What things can you tell others about, encouraging them to be naturalists, too?

Use your journal to write about natural wonders you'd like to explore in your lifetime. Are they being cared for so you and future generations can enjoy them?

Things Made From Trees

Students participate by researching and bringing pictures or drawing pictures of things made of wood used in 1900 and in 2000 to show the differences in lifestyles and differences in wood uses. Discuss: How has wood helped people and changed lives since earliest times?



People and Cultures

Speak for the Trees

You'll need: The Lorax by Dr. Suess.

Read the book together and encourage each student to share the story with a younger child. Ask students: Would you like to change the end of the story? How would you do it and why? What are the main reasons people cut down trees? (For lumber, buildings, houses, fuel, to clear for roads and shopping malls, etc.) Will we ever stop cutting trees? (No, we need them for wood and other things.) How can we make sure trees are replanted to replace those cut down?

The Charter Oak

You'll need: Computer Internet access if using web sites and a Connecticut quarter (state series, issued in 1999).

Show the quarter first. Ask students: Do any of you know what the symbol on the back of the Connecticut quarter stands for? Share the following:

When the 169-year-old Charter Oak died in Hartford, Connecticut, the city bells tolled, a band played funeral songs, and the whole community grieved. The funeral happened on August 21, 1856. The treasured tree had been blown down in a windstorm.

The Charter Oak had been loved and respected for generations. American Indians had held meetings under it and used its new leaves each year to know when it was time to plant corn. Colonists gathered around it. The colony of Connecticut once hid their charter in the tree so they would not have to turn it over when King James II wanted to restrict their freedom. When the Charter Oak blew down, people wanted keepsakes made from its wood. Pianos, furniture, and many small items were made. A carved chair made from the Charter Oak is still used in the Senate Chamber in the State Capitol building in Hartford. You can also see the tree on the Connecticut quarter, issued in 1999 as part of the States of the Union quarter series.

Ask students: What trees are important to you? Can you think of any trees that are special to your whole school or to the whole community? What makes certain trees special? (Age, location, size, place in a historical event, trees planted to honor people or events, etc.) Is there a tree we should give special honor to? How could we do that? (Naming, create a celebration, etc.) To search out ideas, visit American Forests (the oldest U.S. nonprofit citizen's conservation organization) at http://www.historictrees.org to see all the famous trees it has in its historic tree nursery.

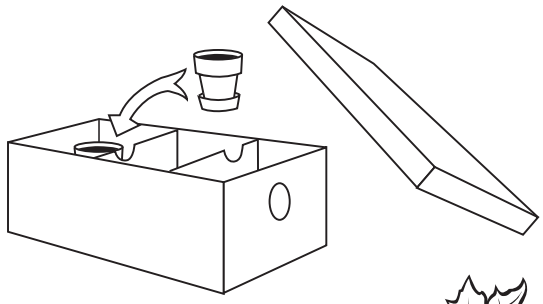
Some trees in Minnesota and across the nation have received special attention for their size. Visit the Minnesota Department of Natural Resources web site at http://www.dnr.state.mn.us/forestry/big_tree or American Forests web site at http://www.americanforests.org/resources/bigtrees to see the state and national registers of big trees.

Science and the Environment

How Important is Light?

You'll need: A large shoe box with the lid, a potato, a small clay pot, soil, pieces of cardboard, and scissors.

This gardening project shows students just how sensitive plants are to light. Cut the potato so there is a section with an "eye" on it. Plant this section in the clay pot. Water the soil in the pot and put the pot in a corner of the shoe box. Using your cardboard pieces, make two partitions to go across the width of the box. Cut a two-inch opening in each partition (stagger these openings). Make a two-inch opening in one end of the box and cover with the lid. Place in an area where the end hole receives good light. The potato will grow out through the holes in an effort to find light.



Discover Nuts

You'll need: An assortment of nuts in shells, a world map, and push pins or self-stick page flags.

Ask students to bring from home or the grocery store 10 to 12 whole nuts still in the shell. Suggest a variety such as: pine nuts, Brazil nuts, hazelnuts, hickory nuts, almonds, cashews, filberts, English walnuts, black walnuts, macadamia nuts, pecans, and pistachios. Examine and identify the nuts. Label each and create a display counter for them.

Divide into small groups to research where the following nuts are grown and an interesting fact or two about them. Each group reports its findings to the class and marks the growing areas on the map with push pins or page flags. As each nut's growing area is discovered, add the information to your display.

- Brazil nuts—Brazil and Venezuela.
- English and black walnuts—English walnuts: California, Oregon, China, Greece, Turkey, much of Europe. Black walnuts: eastern and southern U.S.—Massachusetts to Florida and west to Texas.
- Pine nuts—North America and Europe.
- Hickory nuts—southern and eastern U.S., eastern Canada, Mexico, China.
- Almonds—California, Spain, Italy, Iran, Portugal, Morocco.
- Cashews and filberts (also called hazelnuts)—Cashews: Florida, Central America, Brazil, India, Africa. Filberts: Oregon, Washington, northern California, Turkey, Italy, Spain.

What do you notice about the areas that produce nuts? What do the areas have in common? Where do nuts not grow? Why?

Tree Seed Tasting Party

With all the "nuts" that have gathered in your classroom, have a "tree seed" tasting party. Watch out for students with allergies!

FUN FACT

Seeds to Trees

It takes a bushel of pine cones to produce less than a pound of seeds, but each pound of seeds represents about 55,000 new trees. That's enough to plant over 73 acres of forest land.

Enhancements

Math

Scan the math activities in grades 3 through 5 of this *Teachers' Guide.* Since fourth grade is such a strong transition between lower and upper elementary grades, many of the activities for these grades work well with fourth graders. Try these ideas, too:

Pounds and Pounds of Paper!

You'll need: A scale, paper, and pencils.

How much paper do youngsters use in your school? Here's a survey with surprising results:

a. Each student weighs all the paper in his or her desk (books, notebooks, etc.) on a scale. Add each student's total for a grand total.
b. Divide to find the average weight of paper per student.
c. Multiply the average weight by number of students in the school. What's the grand total for your school?
d. A 16-inch diameter tree yields 700 pounds of paper. How many trees did your school consume?

Forest Math

Create your own story problems using content in this *Teachers' Guide* as a base. Some ideas to get you started:

1. Pretend you are the new owner of Hundred Acre Woods. (An acre is about the same size as a football field.) You decide to plant five new trees on each acre of your woods. How many new trees will you need in all?
2. You want to buy four new young trees to plant in your yard. Each tree costs $14. How much do you pay in all?
3. A Christmas tree farmer prunes one tree in five minutes. How long will it take her to prune 10 trees? 18 trees? How many trees will she be able to prune in one hour?
4. Imagine your schoolyard has three oak trees, five maples, two basswoods, three red (Norway) pines, and three birch. How many trees are there in all? How many are left if one blows over in a windstorm and two die after having their bark damaged by bike locks?
5. A careless camper leaves a fire burning and it starts a forest fire. It burns eight acres of campground. If there were 30 trees on each acre, how many trees were burned?

Answers to Forest Math Activity:

1. 500 trees
2. $56
3. 50 minutes; 90 minutes; 12 trees in one hour
4. 16 trees in all; 13 trees left
5. 240 trees

Super Sleuths

You'll need: Notebooks, pencils, and a 10-foot length of string for each pair of students.

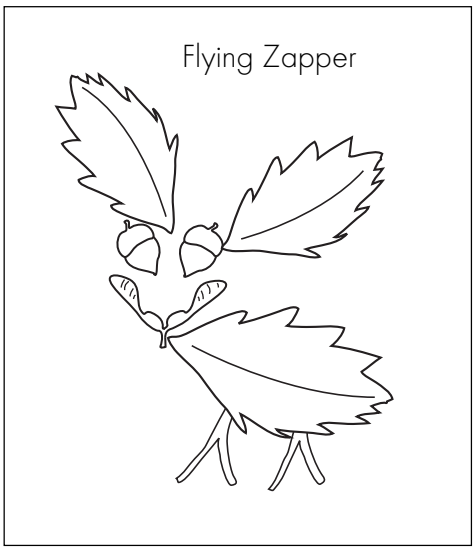
Students work in pairs. Take a neighborhood walk and find undisturbed places with interesting combinations of soil and plant life. Each pair makes a circle with their string, then become super sleuths to discover as many different things as they can in their circles. They observe, count, and jot down at least 15 or more different items in their circles. Back in the classroom, they share their findings with classmates. Did any pair discover 20 or more things? Amazing, but possible! (Examples: leaves, grass, rocks, ants, dirt, seeds, worms, clover, flowers, tracks, butterflies, etc.) Have students create a bar graph representing how many of each item they found. Compare graphs among the class.

The Arts

Tree Monsters

You'll need: Tree debris, construction paper, and crayons or markers.

Tree monsters are lurking in your classroom! Have students go outside and gather items from trees that they can make monsters from. (Remember to gather only those items that can be taken without harming the tree or look on the ground for items already fallen from the tree.) They glue these pieces onto pieces of construction paper and add crayon or paint features and details. What is the name of each monster?



Games and Physical Activities

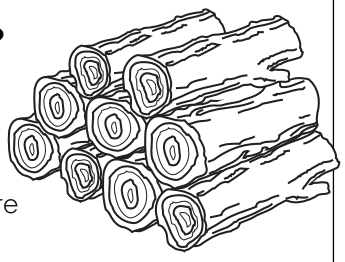
Over and Under Relay

You'll need: Playground ball.

Players line up in relay fashion (one behind another) in two teams. The first player in each team has a ball. At the signal to start, he or she says the name of something that can be found in a Minnesota forest. It can be an animal, tree or other plant, or even something human-related such as camper, logger, hiking trail, cabin. The player then passes the ball back over his/her head to the second player, who says the word and passes the ball between his/her legs to the third player, who in turn says the word and moves the ball over the head. The ball is passed over and under through the whole team. When the last player receives the ball, he/she races to the front of the line, says a new forest word, and starts the ball again. The game continues until one team is back in its original lineup with the player who started the game holding the ball.

FUN FACT

How Much Wood?



Did you know a U.S. citizen uses, in a lifetime, the wood produced by 300 mature trees? In one year, the average U.S. citizen uses 600 pounds of paper, 224 board feet of lumber, and hundreds of other forest products that all come from trees! Much of the timber harvest goes into homes and furniture, newspapers, books, writing paper, film, frozen food cartons, and corrugated boxes. It also goes to produce other valuable wood products like turpentine, alcohol, plastics, rayon, fuel wood, sugar and syrup, barrel staves, shingles, printing ink, baseball bats, chewing gum, musical instruments, dye, shatterproof glass, and shoe polish.

Performance Assessment

Task Statement

Using the "From Paper to Plastic" Activity Sheet, Resources, page 84, each small group tries to identify the more than 40 forest products located in the picture.

Grade 4 Standards

Identify and evaluate how people depend upon forest products.

Rubric—Quality of Performance

4 Exceeds performance standard
3 Meets performance standard
2 Developing toward performance standard
1 Attempt made but many serious errors