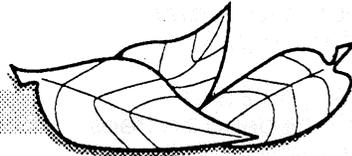


Grade 4

Interdependency of Trees and Us



Objectives

- Students will be able to list ways in which American lifestyles depend upon forest products.
- Students will recognize trees as a renewable resource.

Vocabulary Words

- | | |
|-----------------|--------------------|
| interdependent | renewable resource |
| goods | seed orchards |
| economy | evergreens |
| lifestyle | deciduous |
| consumer demand | |

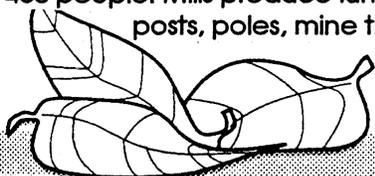
Background Information

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 **goods** that are important to our country's **economy** and **lifestyle**. But how can we be sure we will have a continuing supply of those important goods? We help the forest and the forest helps us. That's where intelligent 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 now and the year 2030. Luckily, trees are a **renewable resource**. The forest industry, mostly in the southeast and the northwest parts of the country, is planning for the future and are planting trees now to meet the demand.

Economic Value

Although Utah's forests are small compared to our neighboring states, they do provide some direct economic return to Utah. A 1997 survey indicated that annual sales of primary wood products amount to \$29 million and employ over 450 people. Mills produce lumber, fence posts, poles, mine timbers, and firewood.



The forest industry has been on the decline in Utah as well as the rest of the western U.S. since the 1960's. Recent surveys have found many of the sawmills that were producing in 1978 have closed, although firewood permits have been steadily rising during the same period. It is evident that the forests are not being logged as extensively as in earlier years.

In addition to wood products, grazing of livestock on a portion of these forests provides some economic benefits through browse and forage utilization while summer shade and protection from wind help prevent livestock weight losses.

Other Values

In addition to the more direct benefits such as forest products, the native forests provide many indirect benefits. Forests are an important part of several state parks and are the primary attraction on the 2.3 million acres of forests managed as National Forests by the U.S.D.A. Forest Service. They provide beauty, watersheds, and recreation to Utah's mountains.

Native forests also provide critical habitat for ruffed and blue grouse, moose, elk, mule deer, turkey, rabbits, cougar, black bear, and other wildlife and plant species. Within the state, water eventually runs into either the Colorado River system or

the Great Basin. A small portion in the extreme northwest corner drains into the Columbia River system. Mountain forests provide much of the water used for irrigation of agricultural crops and for culinary uses such as drinking water. Without these water sources, people could not subsist in Utah.

In every chapter of this book, you'll find information about how people depend on trees. President George Bush, in a speech in Sioux Falls, S.D. (September, 1989) called them "the oldest, cheapest, most efficient air purifiers on Earth." They produce oxygen and provide shade, beauty, protection against wind and erosion, and food and homes for wildlife. They give us fuel, food, and wood products, quiet a highway's noise, 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.

Utah Tree Products

Except for a few introduced palm trees in the St. George area, Utah has two tree types: deciduous and evergreen. The native deciduous trees include quaking aspen, Gambel oak, big tooth maple, box elder, cottonwoods, willows, Rocky Mountain maple, chokecherry, red osier dogwood, water birch, and alder. The evergreens include Utah Juniper, pinyon pine, ponderosa pine, Rocky Mountain juniper, lodgepole pine, white fir, blue spruce, engelmann spruce, subalpine fir, limber pine, bristlecone pine, Douglas-fir, and mountain mahogany.

Here are just a few of the many products trees bring to our lives: (Note-This information may be used as a listening activity with Activity Sheets A and B on pages 9 and 10 of this unit.)

Ponderosa Pine: This tree is prized for its fine wood used to make lumber. It is also a beautiful tree with orange bark that smells like vanilla.

Pinyon Pine: Native Americans taught the pioneers that the pine nuts from this tree were good to eat. Its wood is full of pitch and is used for firewood.

Utah Juniper: Called cedars by the pioneers, it is slow-growing making the wood very dense, thus making durable

fence posts and hot-burning firewood.

Engelmann Spruce: The wood of this tree makes the best violins throughout the world. Its one of the most plentiful commercial trees in Utah.

Douglas-fir: Another tree that produces fine lumber used to make wooden-framed houses. Young trees grown on plantations make excellent Christmas trees.

Quaking Aspen: Shredded wood is used to make swamp cooler pads. The wood is odorless and tasteless and will not splinter- used to make popcycle sticks, toothpicks, and matches.

Lodgepole Pine: Used since pioneer days to make railroad ties, teepees, and lumber.

Gambel Oak: Also known as scrub oak, often too small for wood utilization. Large trees yield wood that is excellent for furniture, wood carving, and firewood.

Blue Spruce: Very popular ornamental tree, prized for Christmas trees, and provides habitat for songbirds.

Box Elder: A county is named after this tree. Helps to filter the water in streams, holds soil.

Fremont Cottonwood: Most massive growing tree in Utah. Used in parks, shelter belts, and for wildlife habitat.

Rocky Mountain Juniper: Very fragrant wood is used to make "cedar" chest, repels moths and is a good alternative to moth balls which are toxic.

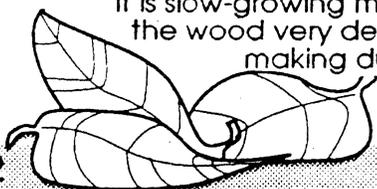
Trees: A Renewable Resource

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.

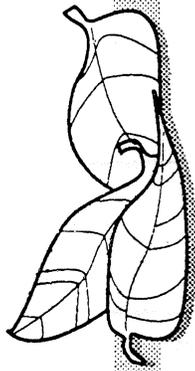
Trees are a renewable resource because you can use them and yet grow a new crop to give more trees in the future. This is different than some of our other natural resources. Silver and gold, oil and gas for example, are mined out of the ground. When they're gone, they're gone for good.

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

The activities in this lesson explore some of the many ways we depend on forest products.



Grade 4



See activity details on pages 4-5 through 4-11.

Calendar

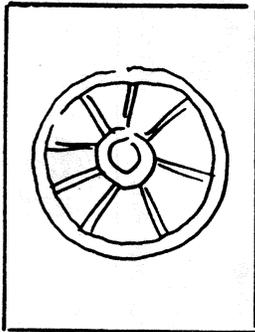
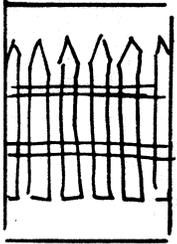
<p> Discuss: In what ways did people of Utah use wood in 1892? How do we use wood today?</p> <p>History</p>	<p> Look for: The "green tinge" in the tree canopy. Create: "Things Made From Trees" bulletin board display.</p> <p>Science</p>	<p> Create: Post wood product pictures on the bulletin board. Discuss: Each item.</p> <p>History</p>	<p> Look for: Tulips and daffodils blooming. Discuss: Any new wood product additions for your bulletin board.</p> <p>Science/History</p>	<p> Do: Ask students to bring a variety of nuts (in their shells) to school. <i>Fun Fact:</i> A bushel of pine cones represents about 55,000 new trees - enough to plant over 73 acres of forest land!</p> <p>Science</p>
<p> Look for: Crab apple trees in bloom. Research: Where do the trees of Brazil nuts grow?</p> <p>Science</p>	<p> Classify: Nuts that were brought to school and label each. Research: Where do the trees for pine nuts grow?</p> <p>Science</p>	<p> Research: Where do the trees for hickory nuts and almonds grow?</p> <p>Science</p>	<p> Research: Where do the trees for cashew nuts and filberts grow? <i>Fun Fact:</i> A pound of pine cone seeds represents 55,000 new trees.</p> <p>Science</p>	<p> Research: Where do the trees for English walnuts and black walnuts grow? Do: Have a "seed tasting" party!</p> <p>Science</p>
<p> Discuss: Which wood products are most important?</p> <p>Language Arts</p>	<p> Look for: Leaves sprouting on the silver maple and elm trees. Listen: <i>Utah Tree Products</i> (Activity Sheets)</p> <p>Science/Language Arts</p>	<p> Look for: Lilac bushes and apple trees blooming. <i>Fun Fact:</i> 56% of Utah's forests are Pinyon pine-Utah Juniper forests.</p> <p>Science</p>	<p> Listen/Create: "The Sugar-Plum Trees." <i>Fun Fact:</i> For every ton of wood produced, trees consume 1.41 tons of carbon dioxide and release 1.07 tons of oxygen.</p> <p>Language Arts/Art</p>	<p> Do: Pounds and pounds of paper activity.</p> <p>Math</p>
<p> Look for: Elm and silver maple seeds falling. Hike: Collect seeds.</p> <p>Science</p>	<p> Look for: Bees pollinating. Discover: Nifty Naturalists!</p> <p>Science</p>	<p> Create: Leaf and seed bug pictures.</p> <p>Art</p>	<p> Create: Complete art project. <i>Fun Fact:</i> If 17 million acres of forest land were covered with healthy young forest, it could supply oxygen for 32 million people.</p> <p>Art/Science</p>	<p> Look for: Monarch butterflies.</p> <p>Science</p>

Bulletin Board Idea

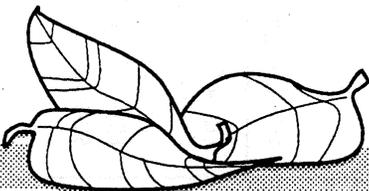
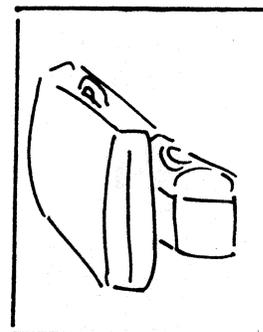
Things Made From Trees

Students participate by bringing pictures or drawing pictures of things made of wood used in 1892 and in 1992-to show the differences in lifestyles and differences in wood uses.

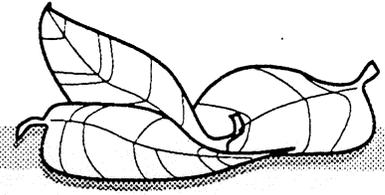
1899



1999



Activities



Hands On - Minds On Activities

Follow these activities in order and you have one for each of the 20 days in Arbor Month (see calendar). Or, pick and choose any of the activities that best meet your class's needs.

To complete the calendar activities during the month, collect or ask youngsters to bring in the following: magazine or newspaper pictures showing things made of wood used in the 1890s (approximately) and today; a variety of whole nuts still in the shell; seeds and plant parts; Roots magazine, Fall 1982 and Cricket magazine, August 1987 if possible.

Activity 1: Brainstorm: In what ways did people of Utah use wood 100 years ago? How do people in Utah use wood products today?

See: Teacher's guide and worksheet "From Paper to Plastic," Appendix page 10 for information and ideas.

Trees give us wood products. Did you know a person uses, in a lifetime, the wood produced by 300 mature trees? In a 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, corrugated boxes...not to mention other valuable wood products like turpentine, alcohol, plastics, rayon, fuelwood, sugar and syrup, barrel staves, shingles, printing ink, baseball bats, chewing gum, musical instruments, dye, shatter-proof glass, shoe polish.

Activity 2: Look for: The "green tinge" in the tree canopy.

Cover a bulletin board with paper and a border. Students create the appropriate border for the bulletin board. (Perhaps a variety of wood products such as different kinds of paper cut into strips or patterns or a border of paper cartons or small boxes.) Be creative!

Activity 3: It all comes from trees!

Put all the pictures brought to school, drawn, or cut from magazines on the bulletin board and discuss each product. Many will be surprised

when things like chewing gum, printing ink, and shatterproof glass show up on the board.

Activity 4: Look for: Tulips and daffodils blooming.

Continue to discuss the bulletin board.

Activity 5: Bring nuts.

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, coconuts, pecans, and pistachios.

Activity 6: Look for: Crab apple trees in bloom.

Research: Where do the trees of Brazil nuts grow?

(Answer: Brazil and Venezuela.)

Activity 7: Which nut is which?

Examine and identify the nuts in the shell that were brought to school. Label each and create a display counter for them. As each growing area is discovered, add the information to your display.

Research: Where do the trees of pine nuts grow?

(Answer: North America and Europe.)

Activity 8: Discover hickory nuts and almonds.

Research: Where do the trees for the hickory nuts and almonds grow? (Answer: Hickory nuts - Southern and Eastern United States, Eastern Canada, Mexico, China; Almonds - Mediterranean Basin countries, China, Iran, California.)

Fun Fact: American Elm harvested in the Red River Valley is sent to Europe and Japan where it is used for building furniture.

Activity 9: Discover cashew nuts and filberts.

Research: Where do the trees for the cashew nuts and filberts (also called hazelnuts) grow?

(Answer: Cashews - South America, other tropic areas; Filberts - produced commercially in Mediterranean countries and Oregon.)

Fun Fact: 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, enough to plant over 73 acres of forest land.

Activity 10: Discover English walnuts and black walnuts.

Research: Where do the trees for the English walnuts and the black walnuts grow?

(Answer: English walnuts - many Northern Hemisphere regions; Black walnuts - Northern and Central United States and South America.)

With all the "nuts" that have gathered in your classroom, have a "tree seed" tasting party.

Activity 11: Group decision making.

Divide the class into groups of three or four. The task is to focus on the 1990s side of the bulletin board, "Things Made from Trees." Which five products are the most important? Each group must decide and agree which items it would eliminate if they needed to eliminate all but five products. Each group comes up with a statement of why it feels those five items are the most important and should be left on the board. Each group then presents its decisions to the class. During its presentation, the group will take down from the bulletin board all but the five items it chose to leave. The following questions may help stimulate thinking:

1. What would happen if suddenly this product was unavailable?
2. Would this product's disappearance affect any of the essentials necessary for survival as, for example, food or shelter? What things are truly necessary for survival?
3. Is the product's current use wasteful? Why? Should the use be eliminated? What would be the impact if it were?
4. Could we find a substitute for this forest product? Is the substitute made from a renewable or non-renewable raw material? What would be the environmental and economic impact of the substitute? Would it use more or less energy to produce than the original forest product?

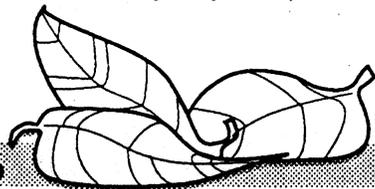
Activity 12: Look for: Leaves sprouting on the silver maple and elm trees.

Continue the debate about the most valuable tree products. Listening Activity: *Utah Tree Products* (Activity sheets A and B, pages 4-9 and 4-10.)

Answers:

Ponderosa pine: lumber, firewood

Pinyon pine: pine nuts, firewood



Utah Juniper: fence posts, firewood

Engelmann spruce: violins, pallets, lumber

Douglas-fir: Christmas trees, houses

Quaking Aspen: excelsior, popcycle sticks, toothpicks, shingles, matches, livestock feed

Lodgepole pine: poles, teepees, lumber, paper, railroad ties

Gambel oak: furniture, firewood, carvings

Blue spruce: ornamental, Christmas trees, wildlife shelter

Box Elder: syrup, filters water in the streams, shadetree

Fremont Cottonwood: park tree, good for shelterbelts, wildlife habitat

Rocky Mountain Juniper: cedar chests, natural "moth balls" - cedar balls, rot-resistant fence posts, paneling, firewood

Activity 13: Look for: Lilac bushes and apple trees blooming. Make a special note of the wonderful aroma in the air while these trees are blooming.

Fun Fact: Utah has 6 National Forests which cover 15% of our state.

Activity 14: The Sugar Plum Trees.

Read to the class Eugene Field's fanciful bedtime poem, "The Sugar-Plum Trees."

Encourage the children to listen carefully to the poem as you read it to them. Can they "see" the poet's picture in their mind's eyes as you read? It may take a couple of readings. Perhaps they have younger brothers and sisters who would especially enjoy the words of the poem. Have the students illustrate the poem for a younger child. Provide a copy of the printed poem to attach to the back or beside the illustration.

Source for "The Sugar Plum Trees:" *Oxford Book of Children's Verses,* by Iona & Peter Opie, Oxford Press 1973.

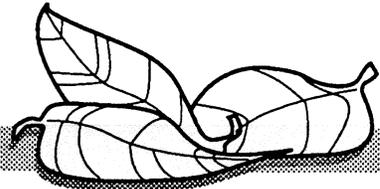
Activity 15: Pounds and pounds of paper!

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 postage 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 used in paper production yields 700 pounds of paper. How many trees did your school consume?

Activity 16: Look for: Elm seeds and silver maple seeds falling.

Spring hike: Take a spring hike and look for seeds and other interesting plant material to take back to the classroom.

Activity 17: Look for: Bees pollinating.

Dr. Ted W. Daniel, Vern Fridley, and Paul Rokich are names of three Utah foresters who have made noteworthy contributions toward the promotion and development of forestry in Utah.

You can be a forester, too! Start a nature journal to write about things you would like to do to help preserve 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 other ideas into action?

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

Activity 18: Leaf and seed bugs.

From the materials gathered on the spring hike, have your students create some leaf and seed bugs. For more specific instructions see Cricket magazine, August 1987, pages 48-49.

Activity 19: Work on leaf and seed bug art project.

Activity 20: Look for: Monarch butterflies. Finish art project.

More Activity Fun

1. **Take a wood-finding tour!** Get permission from a store manager and make a class visit to a local department store, or use a mail-order catalog in the classroom.

As a preliminary step, the class should make up a survey sheet for recording information. Divide the class into teams of three or four students each and ask each team to name one of its members as "recorder." The recorder will log team observations on its survey sheet.

Assign each team to a particular department in the store or a section of the catalog. Students are to identify and record as many items as they can that use wood or forests and the environment.

Ask your students to brainstorm a list of environmental things affected by the forests. This list might include such things as water quality, air quality, and landscape aesthetics.

Each student chooses one item from the list and creates a poster advertising its value to humans, other organisms, and/or the biosphere. Display your posters for all to enjoy!

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2. **We All Need Forests** (Activity Sheet C, page 4-11.)

What would you do if you were in charge of 20,000 acres (8000 ha) of forest? If you owned a paper company, you would probably plant a species of fast-growing pine or other "paper tree" and manage as much of the forest as you could for pulpwood. If you were a wildlife biologist, you would try to manage the forest in a way that would provide the best habitat for the different species of wildlife you wanted to protect. And if you were a recreation planner, you might manage the forest to provide good campsites, hiking trails, ski paths, fishing streams, bike paths, and wildlife study areas.

Although most people don't realize it, most of the forests in this country are managed. How a

forest is managed depends on what it will be used for. In the past, most forests were managed for only one type of use, such as for raising pulpwood trees. But today, many more are being managed for several different uses at a time through the practice of *multiple use management*.

In this activity, your group will get a chance to discuss different forest uses and how some of these uses compete. They will also learn why multiple use management is so important.

Start off the activity by asking your group to name ways that they or their families use forests (for hiking, birding, hunting, fishing, camping, and so on). List the uses they come up with on the chalkboard or a large sheet of easel paper. Review again that forests are also important because they provide habitat for many types of wildlife and contain important natural resources. Next, ask someone to define the word *manage*. Explain that in order for people to use forests in different ways, forest managers must manage forests in different ways.

Pass out copies of *We All Need Forests*, page 4-11. Tell students this page lists some of the things that many forests are managed for. Ask them to look at the three rows on the page. Starting with the first row, labeled "**wildlife**," discuss some of the ways forests are *managed* to help protect different species of wildlife. This background information will help explain how forests are managed for wildlife:

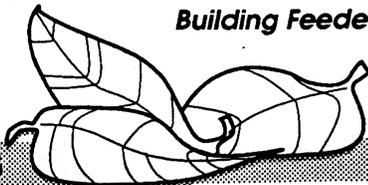
Saving Snags: One way people manage for wildlife in a forest is by leaving dead trees, or snags, standing instead of cutting them down. Snags provide nesting cavities for many birds and mammals, such as owls, woodpeckers, wood ducks, bluebirds, raccoons, and squirrels.

Building Brushpiles: By building brushpiles in a forest and along forest edges, forest managers help provide hiding and nesting sites for many animals that live on the ground such as foxes, rabbits, wood thrushes, and chipmunks.

Letting Logs Lie: Many types of animals use logs for nesting and hiding places. By not removing logs, managers can help provide homes and feeding areas for many kinds of wildlife.

Building Feeders and Nesting

Boxes: Putting up nesting



boxes in forests that have limited nesting sites can help attract wildlife. So can setting up feeding stations for birds and mammals.

Burning: For some species, the only way to maintain the right kind of habitat is to burn the area on a regular basis to get rid of undergrowth.

Picking the Right Plants: By planting certain types of trees and shrubs in a forest area, wildlife managers can provide habitat for specific types of wildlife.

Now have the students look at the row labeled "**recreation**." Compare this list with the list the children came up with. Discuss the fact that the forest is an important place for people to relax, learn more about and enjoy nature, and exercise.

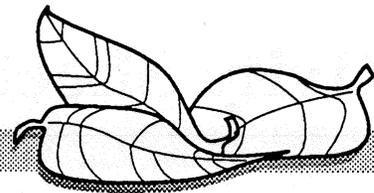
Explain that some of the ways people use forests for recreation compete with the needs of wildlife and can also disrupt the plants that grow there. For example, to build ski slopes in a forest, heavy equipment must come in and cut down trees to make the runs. Roads and parking lots must be built so that people can get to the slopes and park. Many times ski lodges and other facilities are also built.

Ask students to think of other ways recreational uses of the forest can harm the wildlife. The role of many forest managers is to balance the uses of a forest so that wildlife can be protected and people can use it for recreation, too.

Finally, have students look at the row labeled "**products**." Many forests are used for commercial purposes. Some forest areas are managed for lumber, some are managed for pulpwood, and some are opened up for oil, gas and mineral uses. These uses can upset the forest community and compete with wildlife and recreational uses. For example, you probably wouldn't want to camp near a strip mine in a forest or hike along an area that is being harvested. Why is it important to have commercial uses in a forest? (People need forest products.)

Adapted from Ranger Rick's Naturescope: "Trees are Terrific." Used with permission.

Activity Sheet A

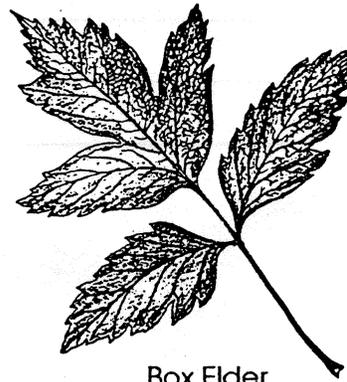


Utah Tree Products

Listening Exercise: Listen as someone reads to you about Utah tree products. Make a list of the products for each tree as you hear them. Most, but not all of the trees you hear about, are shown on these pages. Then go back and draw pictures of those products.



Gambel oak



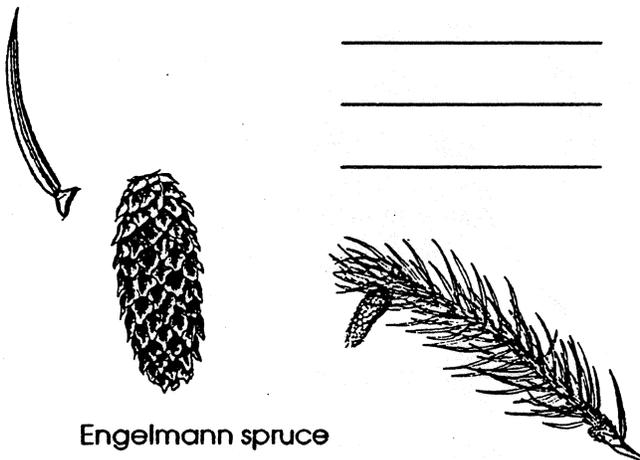
Box Elder



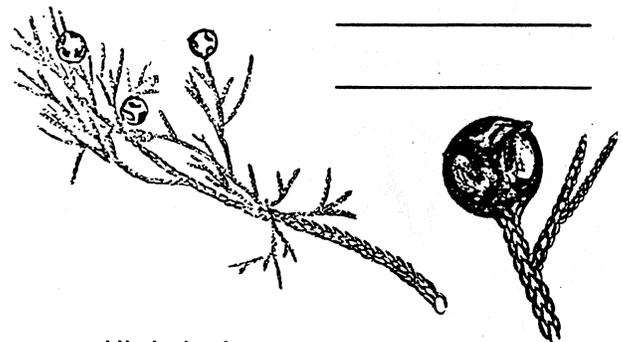
Quaking Aspen



Pinyon pine



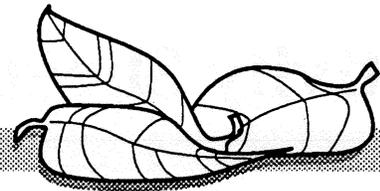
Engelmann spruce



Utah Juniper

Answers: See Activity 12, page 4-6. Read-to-Kids Information: Utah Tree Products page 4-2.

Activity Sheet B



Utah Tree Products

Listening Exercise: Listen as someone reads to you about Utah tree products. Make a list of the products for each tree as you hear them. Most, but not all of the trees you hear about, are shown on these pages. Then go back and draw pictures of those products.

Douglas-fir

Lodgepole pine

Ponderosa Pine

Blue spruce
(Utah State Tree)

LEAF

FRUIT

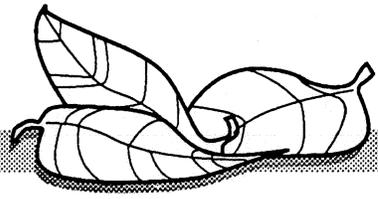
ENLARGEMENT

Rocky Mountain Juniper

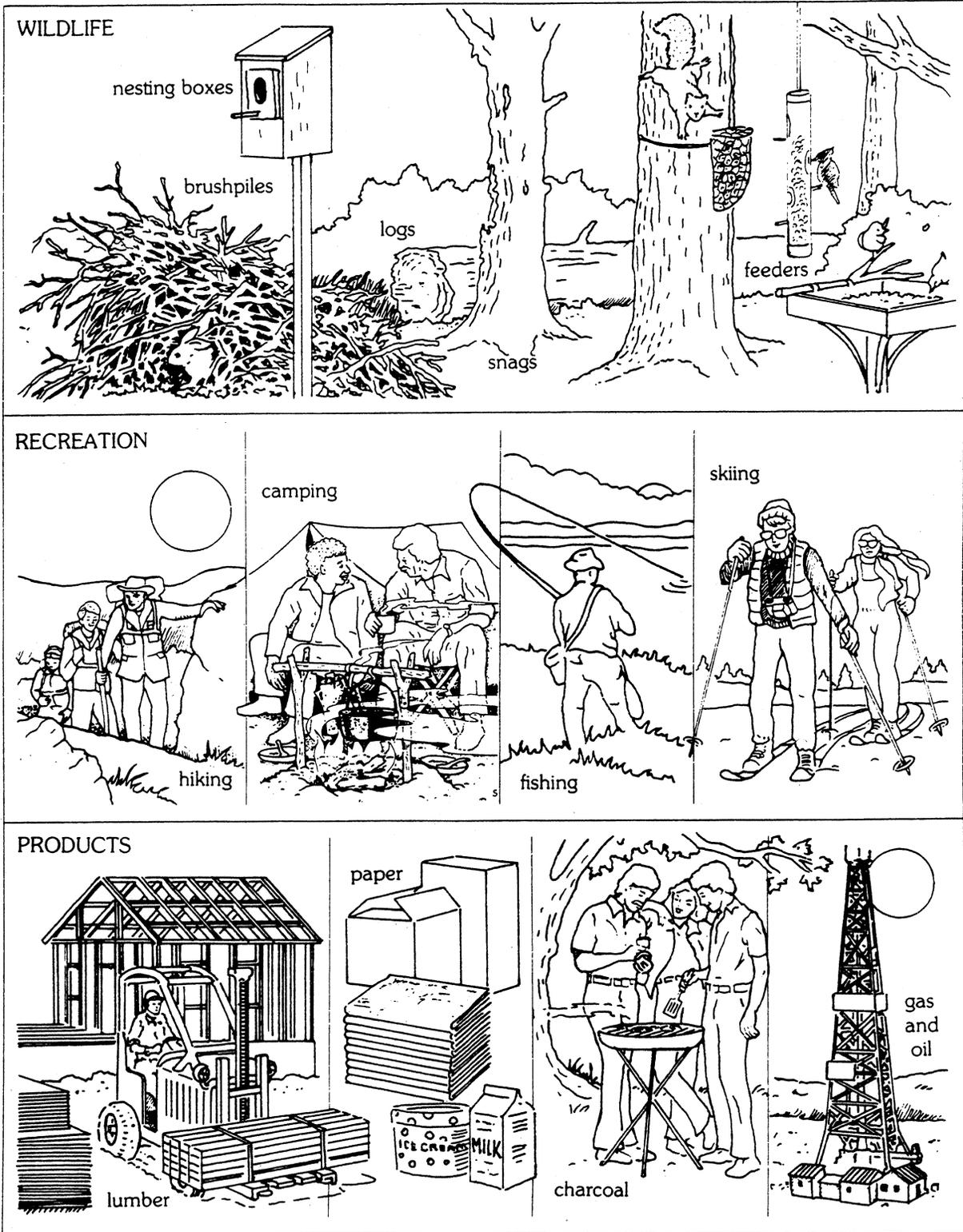
Fremont cottonwood

Answers: See Activity 12, page 4-6. Read-to-Kids Information about Utah Tree Products page 4-2.

Activity Sheet C CopycatPage



We All Need Forests



From Ranger Rick's Naturescope, "Trees are Terrific." Used with permission.