This lesson was funded by Minnesota Project Learning Tree and the Sustainable Forestry Initiative State Implementation Committee, and provided by the Minnesota Department of Natural Resources.

Mother Earth Provides

Overview

Tribal, private- and public-owned forests are often managed to provide many different resources. In this activity, students will learn how forests are managed to meet a variety of human and environmental needs.

Objectives

Students will 1) identify ways that people use forest resources, 2) compare uses of the past with uses today, and 3) explore how forests are managed to satisfy a variety of human and environmental needs.

Grade

6-8

Subjects

Science, Social Studies, Math, Visual Arts

Background

The Anishinaabe and Dakota have lived for a long time in Minnesota's forested areas, relying on the trees and plants for survival. Can you imagine a time when there were no grocery stores, pharmacies, hardware stores, apartment complexes, or online shopping options? Where would you get all of the things you need to live a good life?

Birch bark

Perhaps the most important tree for the Anishinaabe is paper birch (*Betula papyrifera*)[i], or wiigwaas (wee-gwahs)[ii]. Paper birch bark grows in many layers. If harvested appropriately, people can use the bark for many purposes without harming the tree and allowing it to grow back and be harvested again.

Paper birch bark was used mainly to cover lodges, known as a wiigiwaam (wee-gi-wahm)[iii]. The bark provided a protective outer layer that was waterproof and long-lasting, preventing spring, summer, and fall rains from getting inside.

The Anishinaabe practiced a lifestyle known as a "seasonal round" where they traveled between locations depending on the resources available that season. Each time they traveled, they deconstructed their lodges and carried the sheets of birch bark from place to place. Many said that if cared for properly, these sheets could last long enough for families to hand them down to the next generation!

Wiigiwaam made from birch
Minnesota Historical Society Collections Online; original photo: Charles A Zimmerman; E97.31 r85

Birch bark's waterproof nature also made excellent material for creating bowls, cups, storage containers, baskets, and much more. The most common birch bark vessel, a makak (muh-kuhk)[iv], is multi-purpose, used for collecting sap from maple trees, transporting water, or collecting berries. People could even use makaks for cooking over a fire! As long as the vessel had water in it, it would not burn.

Makak
Minnesota Historical Society Collections Online; 2100.E201.1

Within the bark, an oil known as betulin has several useful properties. For example paper birch bark is an excellent fire starter. The betulin is very flammable when there is no water present, making birch bark an excellent choice for starting campfires when you have no other materials to do so. Traditionally, betulin was useful during hunting, especially when far away from your camp. People wrapped fresh meat in the bark arranging the inner layers of the bark against the meat. This method allowed hunters to preserve the meat for several days without spoiling or letting insects get to it before transporting the meat home for drying, smoking, or cooking.

Today, Anishinaabe artists in Minnesota use birch bark to produce functional works of art. Pat Kruse is a well-known Ojibwe artist who works with birch bark. Originally, from the Red Cliff Band of Lake Superior Chippewa in Wisconsin, Pat works out of the Mille Lacs Band of Ojibwe[v].

Birch bark tray by Pat Kruse
Minnesota Historical Society Collections Online; 2015.63.1

Sugar maple

Sugar maple (*Acer saccharum*[vi]) is an important tree for the Anishinaabe. Following the tradition of a seasonal round, each spring families would gather in sugarbushes that were harvested generation after generation to produce maple syrup and sugar. It is said in the community that the return of the crows signified the beginning of sugar season.

People would tap the trees with wooden taps, collect sap, and boil the sap down to produce either syrup or sugar. The right conditions for the sap to run are warm, sunny days (above freezing) and cold nights (below freezing). Maple sap contains a lot of water. It generally takes 40 gallons of sap to produce a single gallon of syrup.

Porky White working in the sugarbush, Heart of the Earth Survival School
Minnesota Historical Society Collections Online; original photo: Randy Croce; E99.32 p24

Maple syrup and sugar were useful in trade relationships as well as for preserving food, similar to the practice of salting foods in Europe. Today, communities still gather in sugarbushes to harvest maple sap and produce syrup and sugar for personal use and commercial sale.

Slippery elm

In Minnesota, evidence shows that Dakota once resided in the hardwood forests near what is now Mille Lacs (Mde Wakan) and lived in more permanent villages. They relied on both agriculture and hunting parties who traveled long distances. Dakota living in the villages near Mille Lacs created large bark lodges, made from the bark of slippery elm (*Ulmus rubra*). This bark, when removed, has a slippery inner texture (hence the name) that helped keep the lodges cool during the summer months. Slippery elm bark does not last as long as birch bark and needed to be replaced occasionally as it dried out and became brittle. [vii]

Later, the Dakota moved west to the prairie areas of the state, where they used tipis (tee-pees). Tipis are easy to move from location to location, so that bands of Dakota people could followed buffalo (bison) herds.

Dakota bark lodges made from slippery elm
Minnesota Historical Society Collections Online; original photo: W. (Truman Ward) Ingersoll; E91.32 r32

Cottonwood

Each year, the Dakota celebrated the Sundance, an annual ceremony of renewal for the people and the earth. The Dakota performed the Sundance around a central pole made of cottonwood (*Populus deltoides var. occidentalis)*[viii]. The Sundance ceremony continues to be practiced today.

Boxelder

The Dakota harvested sap from boxelder (*Acer negundo*)[ix] trees similar to the Anishinaabe and the sugar maple. Boxelder are maple trees that grow in prairie environments. About 60 gallons of boxelder sap are needed to produce one gallon of syrup.

Hackberry, Chokecherry, Dogwood, White Cedar

Dakota people harvested fruit from both hackberry (*Celtic occidentalis)*[x] trees and chokecherry shrubs (*Prunus virginiana)*[xi]. They dried the fruits and used them to season dried buffalo meat, producing wasna (waa-shnaa)[xii], which could be stored and eaten over the winter. People also used the straight, young shoots of chokecherry to produce arrows. The Anishinaabe used red willow (also known as red osier dogwood, *Cornus sericea*)[xiii] and white cedar

(*Thuja occidentalis)*[xiv] as important pants for ceremonial uses.

Tribal Forests in Minnesota Today

On modern reservations in Minnesota, Annishinaabe people manage forest areas for timber harvest, habitat restoration, creating forest openings for blueberries, and recreation. For example, the Leech Lake Band of Ojibwe manages the forest for ecological health (clean water, productive wildlife habitat, forest regeneration, etc.) using timber harvest as one tool. Proceeds from timber sales to go landowners, the band, and the Minnesota Chippewa tribe. Harvests are done for several reasons, such as opening an area for a home site, removing low-quality trees to encourage better-quality trees, improving wildlife habitat, and for economic gain.[xv]

Tribal forest managers also manage forests to restore habitats while allowing for recreation. For example, in 2018, the Prairie Island Dakota community in southeastern Minnesota formed a partnership with the Army Corps of Engineers to improve and restore floodplain forest habitat on Buffalo Slough Island.[xvi] Many miles of trails, designated for specific uses such as all-terrain vehicle and off-highway vehicle riding, snowmobiling, or cross-country skiing, run through state- and federal-managed lands that cross reservation lands.

In 2020, the Fond du Lac Band of Lake Superior Chippewa's tribal council and natural resources staff began requiring permits to cross their lands to help offset the costs of restoring these habitats.[xvii]

Minnesota Forest Basics

Minnesota contains around 15 million acres of forests. Of that, a little more than half are managed for public use by federal, state, county, and city governments. In addition, most of Minnesota's publicly managed forests are *certified* by the Sustainable Forestry Initiative as "sustainably managed" to maintain a sustainable supply of forest products and services from healthy, diverse, and productive ecosystems. Private landowners and tribes own the remaining forests and can choose to certify their forests too. For more information on how Minnesota forests are managed, see Standing Tall, the Minnesota DNR's Forestry magazine, and the Sustainable Forestry Initiative.

Multiple Use Management

Multiple use management involves making choices about the types of activities that can take place in particular areas. When we consider that forests can be used for multiple uses, we can manage a single forest for hiking, fishing, and camping, while also allowing for harvesting timber and protecting ecosystems.

Some forest ecosystems cannot support certain activities, and certain activities should not take place in the same area at the same time. For example, few people would want to hike alongside a strip mine or camp next to a logging operation. Loggers would have a tough time doing their jobs if people using off-road vehicles were driving through an area where they worked. Protecting a watershed or commercial fishery often requires careful planning of roadbuilding or mining.

Tribal and private family forests are also managed for multiple uses.

The PLT lesson, "We All Need Trees," is a good way to teach about products that come from forests. Also, see the Minnesota DNR interactive posters: We All Need Trees and Health Benefits of Trees

Getting Ready

For Part A, gather pictures of forest animals, of forest recreational activities, and forest products. Pictures you might include are animals (salamander, centipede, mouse, spider, beaver, red squirrel, deer, raccoon, woodpecker), forest recreation (people hiking, camping, fishing, hunting, skiing, snowmobiling, picnicking), or forest products (birch bark, maple sap, homes and wiigiwaams, paper, and wood products, mines, and metals). See The Forest Provides photos to get you started.

Doing the Activity

Part A: Activities in the Forest

1. Show students the collected pictures of forest animals and have them identify each one. Ask if they've ever seen each animal in real life. If they have, ask where. If they haven't seen the animals, discuss why not. (Some may never have been in a forest and even in a forest, people do not see many animals because they hide.) Tack the pictures on a bulletin board or tape them to a board under the heading "wildlife." You may also want to have students name other animals that live in forests.
2. Show students the collected pictures of people doing recreational activities. What are people doing in each picture? Have any students done those activities? Which activities could be done in a forest? (All.) Again, place the pictures on a bulletin board or board under the heading "Recreation," and ask students to name other activities people could do in forest.
3. Show students pictures on a bulletin board or board under the heading "Products," and have students name other examples of forest products.

   Alternative: Try doing steps 1-3 above by asking students to "turn and talk" to their neighbor to brainstorm ideas. Then ask the full group their answers.

4. Have students look at all the pictures you've posted. Explain that people have jobs that:
   a. Manage forests so that the forests can provide homes for wildlife and people
   b. Maintain recreation places for people
   c. Harvest products people need and want.

   Ask students to identify activities listed on the bulletin board that might exist/happen in a forest at the same time. For example, people might snowshoe, hike, or birdwatch ("Recreation") through a forest where owls ("Wildlife") live. Other people may reach camping areas ("Recreation") by driving on the same roads that go to logging areas ("Products"). Some animal species, such as deer, grouse, and sparrows ("Wildlife") actually prefer habitats where logging ("Products") has reduced tree density, while other animals will not do well.

Part B: Then and Now

1. On the board, draw the first two columns in the table below.
2. Show students pictures from the Indigenous Forest Products Student Page
3. Explain what each item is and ask the student to guess what each product is made from. Write each item on the board, what it's used for, and what it's made from.
4. On the board, add one more column, "Today." Ask students as a group to suggest items we use today and what they're made from.

Example

	Early years	**Today**
Homes	Tepee – made of birch bark Wiigiwaams – made of slippery elm bark	Houses – made of pine, cedar
Containers	Makak – made of birch bark	Boxes – made of cardboard or plastic
Toys	Lacrosse stick – made of ash wood	Baseball bat – made of maple Video games – made of plastic and metals
Food	Maple syrup – made from sap of maple trees Berries – picked from bushes in forest	Maple syrup – made from sap of maple trees Berries – picked from bushes on farms
Transportation	Canoe – made of birch bark and pine tar	Cars, bikes – made from rubber, metal, plastic

5. Optional: Head outdoors and "meet" the trees—paper birch, ash, slippery elm, maple, red dogwood, cottonwood—that indigenous people used to make the things they needed. You may even have the students create signs for each tree indicating the species and use.

Part C: Management Decisions

1. Ask students in what ways they use or benefit from forests. Record their ideas on the board.
2. Next, divide students into teams of four. Ask each team to create a chart like this:

Ways people use or benefit from forests	Ways animals use or benefit from forests

Then each team should list five to 10 different ways that people and wildlife use or benefit from forests. You may want to walk among the teams and encourage them to add more to their lists by asking further questions, such as:

a. What kinds of recreational activities have they or their families done in forests?
b. What kinds of products do people get from forests?
c. What animals live in forests (including less obvious ones like fish, insects, worms, and microorganisms)?
d. How do forests affect water and air?

3. Write the words “Wildlife,” “Recreation,” and “Products” on the board. Have teams share ideas from their lists that fit under each category. For example, they may put food or water under “Wildlife,” camping and fishing under “recreation,” and wood for homes or energy under “Products.”
4. Explain that people manage forests with an emphasis on different needs. For example, some forests may be managed to meet the needs of wildlife, others to meet recreational needs, and still others to meet the need for forest products. Some forests may be managed to meet all of the needs above.
5. Tell team members to pretend they are forest managers and need to manage a forest for wildlife. What do wildlife need to survive in the forest? What strategies would they use to promote wildlife? Have each team brainstorm ideas, and then share with the group. Record their ideas on the board in a column next to “Wildlife.”
   You may want each team to produce a chart like this example:

Needs of animals	**Action plan**
Food	*Plant berry bushes, native wildflowers*
Water	
Shelter	

6. Next, have students pretend they must manage a forest for recreational use. Have teams brainstorm what a forest manager would need to do to promote recreation. What types of activities might go on in the forest? What would the manager need to provide for these activities? (e.g. roads, trails, parking, bathrooms, campgrounds, picnic areas). Ask them to share their ideas and record them on the board next to “Recreation.”
   You may want each team to produce a chart like this example:

Forest recreation	**Action plan**
Camping	*Build road, install bathrooms, picnic tables, & fire rings*
Quiet hiking	*Make trails. Install trail signs.*
Off-road vehicle riding	

7. Finally, have students pretend that they must manage a forest to provide products for people. What things would they need to consider to manage the forest in this way? Which resources will be removed from the forest, how will they be taken out, and what will be needed so the resources can be removed? Once again, record the group's ideas on the board in a column next to "Products."
   You may want each team to produce a chart like this example:

Types of products	Resource removed	How removed?	How replaced?
Logs/lumber	*Pine trees*	*Logging*	*Plant new seedlings*
Maple syrup	*Maple sap*	*Tapping*	*Plant new trees as old ones die out*
Berries	*Fruit from bushes or trees*	*Picked by hand*	*Plant new bushes, protect bushes, remove trees that compete with bushes*

   Note: As a time-saving alternative to doing Steps 5-7, you can divide your group into three teams and have each brainstorm a list of ideas of one category—"Wildlife," "Recreation," or "Products."
8. Explain that, in many cases, forests today are managed for more than one use at a time. Have your students look at the lists they created and ask them these questions:
   - Which activities listed can go on at the same time in the same forest?
   - Which activities on the list might conflict with one another if someone tried to manage both at the same time?
   - Would those activities always conflict or conflict only at certain times and under certain conditions?

Enrichment

Students will enjoy putting on silent skits to show different uses of a forest area. Divide students into teams of four and secretly assign each team a forest use such as hiking, camping, logging, skiing, mining, or living in a wildlife habitat. Give teams a few minute to plan and practice their skit, which must involve everyone in the group. After each skit is presented, have other teams guess what forest use was being portrayed.

Invite a tribal or other forest manager or family forest owner in your area to talk to your class about how local forests are managed for multiple uses.

Assessment Opportunities

1. After visiting a local forest, have the students compile information on how that specific forest provides recreation, products, and wildlife habitat.
2. Have the students research ways that forests from another geographic area may be different from your local forest in how it provides recreation, products, and wildlife habitat.

Connections to Standards (Science):

1P.4.2.2.1: Communicate solutions that use materials to provide shelter, food, or warmth needs for communities including Minnesota American Indian tribes and communities. (Reliance on forest resources to build dwellings, such as birch bark for wiigwaams and slippery elm for bark lodges.)

2P.4.2.2.1: Obtain information and communicate how Minnesota American Indian tribes and communities and other cultures apply knowledge of the natural world in determining which materials have properties that are best suited for an intended purpose. (Trial and error practice, also known as experiential learning, with available resources to learn about the properties of different materials like birch bark to use it in different ways.)

4E.4.2.2.1: Obtain and combine multiple sources of information about ways individual communities, including Minnesota American Indian tribes and communities and other cultures use evidence and scientific principles to make decisions about the uses of Earth's resources. (Examples such as Fond du Lac's new permit requirements and Prairie Island's partnership with the Army Corps of Engineers.)

6.1.5.10.1: Explain the concept of sovereignty and how treaty rights are exercised today by the Anishinaabe and Dakota today. (Contemporary harvesting practices for cultural and commercial purposes.)

2.1.5.10.1; 2.2.5.10.1; 2.3.5.10.1; 2.4.5.10.1; 2.5.5.10.1; 2.6.5.10.1; 2.7.5.10.1; 2.8.5.10.1; 5.1.5.10.1; 5.2.5.10.1; 5.3.5.10.1; 5.4.5.10.1; 5.5.5.10.1; 5.6.5.10.1; 5.7.5.10.1; 5.8.5.10.1: Understand that artistic works influence and are influenced by personal, societal, cultural, and historical contexts, including the contributions of Minnesota American Indian tribes and communities.

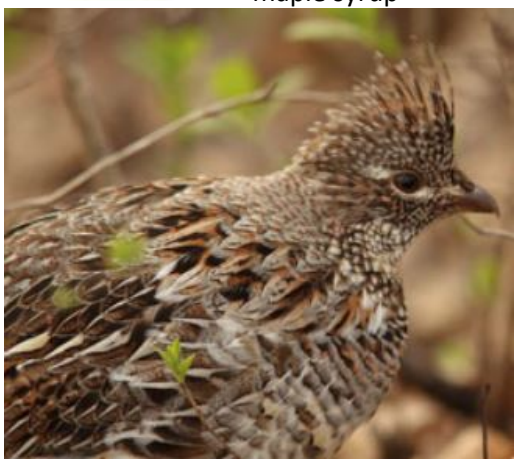
“The Forest Provides” photos


owl


white-tailed deer


maple syrup


firewood

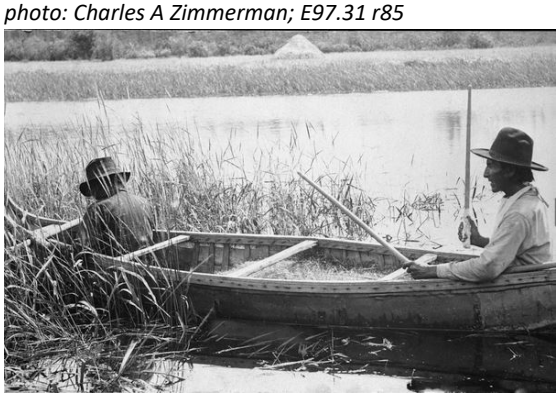

Ruffed grouse


Balsam fir

Indigenous Forest Products student page

Wiigiwam (birch)
Minnesota Historical Society Collections Online; original photo: Charles A Zimmerman; E97.31 r85

Makak (birch)
Minnesota Historical Society Collections Online; 2100.E201.1



Canoe (birch wood, pine tar)
Minnesota Historical Society Collections Online
E97.32W r12

Sugarbush (sugar maple)
Minnesota Historical Society Collections Online; original photo: Randy Croce

Dakota bark lodges (slippery elm)
Minnesota Historical Society Collections Online; original photo: W. (Truman Ward) Ingersoll; E91.32 r32

Ojibwe lacrosse stick made from ash wood
Minnesota Historical Society Collections Online
64.139.18.2

[i] MN DNR: Paper birch https://www.dnr.state.mn.us/trees/paper-birch.html
[ii] Ojibwe People's Dictionary: Wiigwaas https://ojibwe.lib.umn.edu/main-entry/wiigwaas-na
[iii] Ojibwe People's Dictionary: Wiigiwaam https://ojibwe.lib.umn.edu/main-entry/wiigiwaam-ni
[iv] Ojibwe People's Dictionary: Makak https://ojibwe.lib.umn.edu/main-entry/makak-ni
[v] Pat Kruse https://www.pat-kruse.com/
[vi] MN DNR: Sugar maple https://www.dnr.state.mn.us/trees/sugar-maple.html
[vii] MN DNR: Red elm/slippery elm https://www.dnr.state.mn.us/trees/red-elm.html
[viii] MN DNR: Cottonwood https://www.dnr.state.mn.us/trees/cottonwood.html
[ix] MN DNR: Boxelder https://www.dnr.state.mn.us/trees/box-elder.html
[x] MN DNR: Hackberry https://www.dnr.state.mn.us/trees/hackberry.html
[xi] Native Plant Encyclopedia: Chokecherry
https://webapps15.dnr.state.mn.us/restore_your_shore/plants/plant_detail/288
[xii] Dakota Ethnobotany at the Carleton College Cowling Arboretum: Wasna
https://webapps15.dnr.state.mn.us/restore_your_shore/plants/plant_detail/288
[xiii] Native Plant Encyclopedia: Red osier dogwood
https://webapps15.dnr.state.mn.us/restore_your_shore/plants/plant_detail/128
[xiv] MN DNR: White cedar https://www.dnr.state.mn.us/trees/northern-white-cedar.html
[xv] Leech Lake Band of Ojibwe: Timber sales http://www.llojibwe.org/drm/forestry/timbersales.html
[xvi] Tribal Partnership Program: Prairie Island
https://www.mvp.usace.army.mil/Home/Projects/Article/1471029/tribal-partnership-program-tpp-prairie-island/
[xvii] MPR News: Fond du Lac Requires Permits to Cross Land https://www.mprnews.org/story/2020/01/27/fond-du-lac-band-to-require-permits-to-access-its-land