



Teachers' Guide for *Whose Trees Are These?* (Aboriginal Content)

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Cover Design – The *Tree of Life* image on the cover is my own design. For centuries many cultures have incorporated a *Tree of Life* image in their artwork, from sculptures to textiles, to carvings and paintings. This design is an interpretation of the interconnectedness of all life. It shows the strength of the tree supporting the heavens, while the roots reach through to the underworld. The *Tree of Life* is mentioned in many religions, in mythology, in philosophy, in popular culture and in science. While First Nations people did not use illustrations of a life cycle, it was spoken about and used as a teaching tool for living. (See “ The Sacred Tree” by Judie Bopp, Michael Bopp, Lee Brown, and Phil Lane. Also see www.FourDirectionsTeachings.com.)

This is a quote from *Black Elk Speaks*, (as told through John G. Neihardt, University of Nebraska Press, Lincoln, 1961):” *And I saw that the sacred hoop of my people was one of many hoops that made one circle, wide as daylight and as starlight, and in the centre grew one mighty flowering tree to shelter all the children of one mother and one father. And I saw that it was holy.*” *Black Elk*

Famous depictions of the *Tree of Life* include the works of the artist Gustav Klimt and reproductions of Egyptian works on papyrus. The *Tree of Life* is associated with wisdom, rebirth, strength, forgiveness, friendship and prosperity. Other

“tree” art are the intricate birch bark bitings done by Angelique Merasty, a Cree artist from Manitoba. These bitings were first used as templates for beadwork, but came to be recognized as art forms in themselves, and are framed and displayed in galleries.

All the trees and animals featured in this book are found in North America and will be identified on each page in this guide. But this is by no means inclusive.

A tree is defined as a plant with a single trunk having a diameter of 7.5 cm. (three inches) or more at breast height and growing to a height of 4 metres (thirteen feet) or more. A plant not meeting these dimensions is classified as a shrub. The wild plum and the chokecherry can grow to be either a tree or a shrub.

Manitoba First Nations People view trees as sentient creations, and do not make a differentiation between plant life and animal life, but regard all life as interconnected.

The **dedication page** shows a Cedar Waxwing feeding on the berries of a Showy Mountain Ash.

p. 4-5 The White Elm (American Elm) – The veining in elm trees is dark green. But the artist wished to convey the power of the sun shining through the leaves and so lightened the veins. The sun claims to give leaves their green colour. This is true. With the absence of sunlight hours in the autumn the result is the loss of the chlorophyll which creates the green colour. This allows other colours such as brown, orange, red and purple, which are always present in the leaves to show through.

p. 6-7 Bur Oak – “They turn my light into life.” is a statement of photosynthesis. This is the process of converting light energy to chemical energy and storing it in the bonds of sugar, with oxygen as a by-product. Photo (light) synthesis (putting together) looks like this: carbon dioxide + water + light = sugar + oxygen. The sugar is the plant food.

p. 8-9 This is the artist’s conception of Little Limestone Provincial Park in northern Manitoba, with a focus on the rock formations surrounding Little Limestone Lake. The limestone bedrock covers an area rich in mineral deposits known as the Thompson Nickel Belt. The limestone has many sinkholes and caves created by

the water's dissolution of calcite. A body of water that contains dissolved limestone is categorized as a marl lake. The heat of the sun changes the colour of the lake from turquoise to milky blue. The lake is surrounded by black spruce, tamarack, jack pine, willow, trembling aspen and swamp birch. The growth of algae on the rock, as well as erosion by wind and water helps to break rock into "sweet, rich soil." Decaying matter accumulates creating layers. The fossil on the face of the rock is a fisherite, a variety of calcareous algae resembling the centre of a sunflower sometimes erroneously called a sunflower coral. The "deep, hidden things" is a reference to objects such as stone tools and arrowheads that might be found within layers or in crevices, since this is the traditional territory of Mosakahiken Cree Nation. Birch bark was used in the making of canoes and storage boxes. Willow bark was used to make nets. The inner bark of red willow is used to make kinnikinnik which can be smoked. Willow was also used to make flutes and whistles.

p. 10-11 White Spruce – Manitoba's Provincial Tree

First Nations People had many diverse uses for spruce trees. The spruce roots were flattened and split, then used for sewing because they were durable and flexible. Spruce resin was used in the making of canoes. Spruce boughs were used to make shelters for people on the traplines. The poles for tipis were often spruce, while the bark was used occasionally to cover the conical formation.

The earth claims to provide oxygen to the roots so the trees have energy. In order for a tree to take up water and nutrients, it must continually grow new root hairs. The cells that make up these hairs require oxygen and give off carbon dioxide as they burn carbohydrates to obtain energy. This is why you can "drown" a house plant by watering it too much. If the soil gets too saturated, the root cells can't get enough oxygen to grow root hairs and die.

Professor Suzanne Simard (Ph.D. University of British Columbia) found that the earth supports an underground network of fungi that connects trees and plants. Water and its load of minerals/nutrients are moved along allowing trees to help one another to thrive. Another method of plant communication (not necessarily trees) is through the release of volatile chemicals into the soil. These chemicals are taken in through the root systems of other plants which respond

appropriately. This means different things to the trees. For example, the receipt of a chemical signal could cause the tree to produce toxins to try to deter an infestation.

p.12-13 Manitoba Maple Water is behind the upward flow of nutrients. Poetic license must be taken into account with the use of the word “wiggle”.

p.14-15 Young students should be invited to find the image of a rabbit in the clouds on page 14. On the following page a chickadee feeds on the cones of an eastern white cedar.

p.16-17 Trembling Aspen “I touch them everywhere.” Trees are affected by air quality throughout the world(everywhere). An alternate meaning for the phrase is that every part of a tree is touched by air. Trees need small amounts of oxygen for cell root growth. Carbon dioxide is needed for photosynthesis. Both are components of air.

The trembling aspen is the heaviest and oldest living organism in North America. The root system of the aspen sends up new stems as older ones die out. These produce clones of the “parent”. Although the tree does produce seeds, it is mostly propagated by cloning. It has the widest distribution of any tree species in North America. The leaves of aspens grow on long flattened stalks, which make them “tremble” giving the tree its name.

p.18 Green Ash The green ash is in the classification of trees which are dioecious. This means that male and female flowers are produced on separate trees.

The magnifying glass on p. 18 shows the male flowers. The female flowers are small collections of filaments (not shown). Also in the magnifying glass are the seed “wings” produced by the female tree.

p. 19 Eastern Cottonwood

The eastern cottonwood is also dioecious. The male tree produces gold, green or purple catkins (not shown). The female catkins are green (shown in the magnifying glass). The trees are wind pollinated. After seed pods have developed, the female catkins split open to release numerous small seeds attached to cotton-like strands, hence the name cottonwood. In North American folklore there is a

story that says that shields used by warriors were made from the cottonwood tree. Now if a home has a carving in it made from cottonwood that home is similarly “shielded” from evil spirits, or energies that could cause harm. A cross-cut of a twig from the cottonwood tree reveals a star shape. A connection is made from the tree to the stars in the night sky.

p. 20-21 The cones of jack pines need hot temperatures to open and release their seeds. Fire facilitates the release of seeds which will germinate and grow. A ravaging fire also cleanses trees of disease if a particular stand is infected. The heat of the fire burns away the diseased trees allowing healthy specimens to grow. Ashes from a forest fire provide fertilizer to assist in regrowth. The saplings shown on the lower right page are bur oak. The bark on these trees is very thick and often survives fires. The trees quickly send up shoots to repopulate the forest.

p. 22-23 There are six animal homes on these pages. They are: 1) The burrow of a chipmunk at the base of a tree, often camouflaged with leaves. 2) The “scar” in the tree, third from the left, is the home for a red squirrel. 3) At the base of the same tree depicted in the magnifying glass is the web of a forest tent caterpillar. This insect is found in hardwood forests throughout North America. After hatching the larvae feed on the foliage of trees. They spin silk mats or tents in the crotch of branches or around leaves to gather as a resting place. 4) On page 23, the collection of leaves and twigs is the home of a red squirrel. Squirrels are opportunistic and will use available spaces for nesting, even attics of houses. 5) Beneath the red squirrel’s home is a larger collection of leaves and twigs. It is the home of a gray squirrel. 6) A beaver dam constructed of trees. Trivia: The largest beaver dam in the world is in Wood Buffalo National Park, Northern Alberta, Canada. It is 850 metres long (2790 feet) and is visible from space.

p. 24-25 There are many foods for animals found in forests. Among those provided by trees are from left to right, maple keys for birds, elm seeds for birds, pine cones and acorns for birds and squirrels, wild plums for bears, deer, birds, insects, raccoons and red foxes. Deer feed on the leaves and bark of trees. Yellow-bellied Sapsuckers (woodpecker family) feed on tree sap and on the insects found in trees. Wood Ducks nest in tree cavities. They feed on duckweed, seeds, fruit and insects. Bears will eat the bark of trees in spring. The red-sided garter snake

is introduced here to pay attention to the food chain. Bears feed on the snakes which feed on rodents, frogs and insects. Trivia: Manitoba's red-sided garter snake dens are world famous for having the largest concentration of snakes in the world. Researchers estimate that about 100 000 red- sided garter snakes spend the winter months within the area known as the Narcisse Snake Dens.

p. 26-29 Tamarack also known as larch. It is a coniferous tree that grows in wetlands. The needles turn orange in autumn and are shed. Trees play a large role in the lives of people. The places we live and work, as well as the beauty of our recreation, is often based on trees. Trivia: 1) Burning of the Yule log is a ritual from the Dark Ages in Europe. At the time of the winter solstice a large log would be brought inside and lit to stave off the darkness and the malevolent effects of evil spirits. 2) In the west country of England the remains of cider kegs were poured around trees in an orchard accompanied by singing and dancing. This was done to ensure good crops the following year. It gave rise to the toast "wassail" in greeting.

A Mohawk prophesy says this: "Peacemaker came and used the Tree of Peace with four white roots. At a time of disunity three will be left. (It is not known to what the "three" refer.) They will return to a virgin forest where big trees are, a real forest. They'll build a fire and have a ceremony."

p. 30-31 The trees defend their majestic presence.

p. 32 The variety of life found on our planet and the connections between species and ecosystems create the biodiversity which we enjoy. This is an Ojibwe Prayer of Thanksgiving that recognizes and respects this diversity:

*We give thanks, humbling ourselves to creation, grateful to the Breath of Life
Thank you Breath of Life, for the earth, for the world
The life-giving fire that warms me when I'm cold
For the birds, for the swimmers, the crawlers, the trees
The cycle of time, the seasons
For all these things affect my being, with their gift of creation
And so we correlate Spirit with all that is called Nature
Because it is Life itself.*

Related Activities:

1. Draw a picture of your favourite tree or leaf.
 2. Create your own *Tree of Life* designs. Include animals, people, birds, or any other aspects of the natural world.
 3. Adapt this book into a play, ending with a dance of trees rooted to a spot but waving their branches. This would work for an Earth Day presentation.
 4. Make leaf rubbings.
 5. Compare the bark of different trees.
 6. Discuss birch bark art, birch bark canoes, birch bark cloth, and birch bark paper.
- Trivia: To get syrup from a sugar maple the ratio is 40:1. To get syrup from Manitoba maple the ratio is 70:1. To get syrup from birch the ratio is 100:1.
7. What is the strangest looking tree? Do some research. Draw a picture.
 8. How are trees in different countries suited to that climate? Choose a tree. Do research.
 9. Do *Readers' Theatre* using this book.
 10. What is a person who studies trees called? Answer: An arborist studies trees. A dendrologist studies trees and woody plants. A botanist studies trees and plants.
 11. Identify the trees that are growing close to where you live.
 12. Have you ever planted a tree? What kind of tree was it?
 13. How is the age of trees determined? What else can be learned from tree rings?
 14. What is petrified wood? Where can it be found?
 15. Think of all the words used for "said" in the book. Example: beamed, murmured etc. Think of some of your own words. Choose any 2 words and write sentences of your own.
 16. Create a story web for this book. Now remove "trees" from the central position and replace it with your own name. Decide how "water", "air", "fire" etc. affect you. Write a new story.
 17. Make a list of all the animals mentioned in the book. Choose any four animals and tell how trees help them. Then draw a picture for each.
 18. After the trees have been identified on each page have students unscramble the following: mle, aok, ietwh puresc, toctnoodwo, rnege sah, nepsa, atmarkac, lowilw.