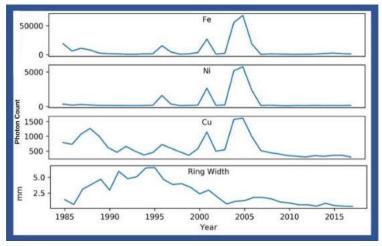# Overview Document

The Trans-Canadian Research & Environmental Education (TREE) program is an opportunity for students from across Canada to be part of national research conducted by the Mistik Askîwin Dendrochronology Laboratory (MAD Lab) and the Canadian Light Source (CLS) to examine the environmental impact on trembling aspen trees. The MAD Lab (studying tree growth) and the CLS (studying chemistry) are able to look at tree cores, specifically the chemistry of tree rings, and connect that information to a student-developed timeline of environmental events from the area samples were taken. Resources connecting to STEM and Indigenous perspectives help students learn about the life of trees, nutrients in soil, how to connect to their community, and how to apply that knowledge in deciphering data from our labs. Data from all samples is uploaded to our database and made available for all. The TREE program takes an interdisciplinary approach and has been adapted to meet Canadian curriculum outcomes in Grades 6 to 12.

This is an example of the data produced from a tree core that has been analyzed by our labs. The top three graphs show changes in 3 elements of interest while the bottom graph shows how the ring width changes over time, reflecting tree growth. By comparing these graphs, students and researchers can make connections. Does the decline in tree ring width after 1995 have something to do with the slight increases in copper, nickel, and iron? What was happening in the area at this time? Why do these elements continue to increase and the ring width decreases as the tree ages? The TREE program suggests answers to these questions.

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Language Contributors: We acknowledge Indigenous language support from Kato Carriere (Cree-Métis) of Cumberland House, SK and Theresa Toulejour (Dene-Métis) of La Loche, SK. See About the Indigenous Languages and Traditional Knowledge Used in TREE section for more information.

Document Update: October 22, 2021

Introduction & Background

The TREE program is a partnership between scientific research led by the MAD Lab and science education led by the CLS Education Team. Both institutions are on the University of Saskatchewan campus in Saskatoon, SK which is located on located on Treaty Six land in the traditional territories of the Nêhiyawak (Cree), Anishinabek, Lakota, Dakota and Nakota Nations, and the homeland of the Métis. As educators, we respect Indigenous Ways of Knowing and oral traditions. We dedicate ourselves to moving forward in the spirit of partnership, reconciliation, and collaboration.

Why TREE?

From a scientific perspective, trembling aspen (*Populous tremuloides*) are a species of tree that is abundant throughout most of Canada. They also tolerate, even thrive, with much higher levels of toxins in their soil than most other species of trees and can potentially be used to remediate contaminated sites. The MAD Lab is interested in researching: what toxins are present in trembling aspen and how much these trees can tolerate and still thrive; if location or geography affect the accumulation of toxins; and if these factors can be related to climactic or human events in the time span of the tree. With CLS, both labs are interested in developing new ways to apply synchrotron techniques (spectroscopy) to dendrochronology (tree ring) research. To validate the technique and conduct such research, many geographically diverse samples are required from across the country. Your class can contribute to this citizen science project and in return, your data and a report is sent back to you. What was happening in your trembling aspen and soil throughout the years? These are questions your students can start to explore. All data is also uploaded to our growing database and your students can compare to schools from across the country. What do trees from across the country tell us?

What are the Classroom Connections?

From an educational perspective, tracking effects on trees over time provides a wealth of opportunity for student learning. The TREE program connects with curriculum across several subject areas and grade levels. Although science is at the core of the TREE program's educational agenda, concepts and broad questions connect to Indigenous Studies, Social Studies, English Language Arts, Mathematics, and Art, are included. TREE provides an interdisciplinary learning platform for students as they investigate trees and how they grow including nutrient cycles and cells; the effects of environmental conditions and the climate on soils and trees; economic and industrial history of their community related to the timeline of tree growth; local Indigenous knowledge related to the trees, history, and the environment; chemistry analysis and graphing as it relates to their data; and many more possibilities for expanding knowledge. This content is shared in modules on each of the topics (all of which are at the disposal of the educator to use), lesson plans, activities, and videos to help support student learning.

Educators are encouraged to apply their knowledge and adapt the content of the TREE program to meet any curricular outcomes fit for their jurisdiction. On the next page, we have outlined how TREE can fit into Grade 8 curriculums across Canada. We encourage you to reach out to the CLS Education Team if you have any feedback regarding curricular outcomes you met with your class in your engagement with the TREE program. Such feedback will serve as testimony to the range of this program and enable us to deepen the base of future editions of TREE.

What is the Cost?

Using equipment provided by the Research Team, students collect *trembling aspen tree cores* and *soil samples* as well as construct a *timeline* with information about the climate and environmental activities of the region of their tree. These are sent in to the Research Team and we cover the cost of shipping and receiving. **There is no cost** thanks to the support of the Natural Sciences and Engineering Research Council of Canada (NSERC) PromoScience grant.

Participation is open all school year and be sure to check out our calendar online, as there are certain times of the school year, where we cannot provide a quick turnaround for data, as CLS enters a maintenance period. Need to know more? Please email the CLS Education Team and we would be happy to help!

General Curricular Connections

Jurisdiction	Course	General Outcomes	TREE Resources
AB/NT/NU	Science 8 (2003, updated 2014)	**Unit B:** Cells and Systems	Module 1, Module 3
		Unit C: Light and Optical Systems	Section 5.2, Section 6.2, Section 6.3, Section 6.4
	Social Studies 8 (2007, updated 2015)	**Historical Worldviews Examined**: Local and Current Affairs	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2007, updated 2016)	Shape and Space (Measurement)	Section 4.2, Module 6
		Statistics and Probability (Data Analysis)	Section 4.2, Module 6
BC/YT	Science 8 (2016)	**Big Idea:** Life processes are performed at the cellular level	Module 1
		Big Idea: Energy can be transferred as both a particle and a wave	Section 5.2, Section 6.2, Section 6.3, Section 6.4
	Social Studies 8 (2016)	**Big Idea:** Human and environmental factors shape changes in population and living standards	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2016)	**Big Idea:** Analyzing data by determining averages is one way to make sense of large data sets and enables us to compare and interpret	Section 4.2, Module 6
MB	Science 8 (2000)	**Cluster 1:** Cells and Systems	Module 1, Module 3
		Cluster 2: Optics	Section 5.2, Section 6.2, Section 6.3, Section 6.4
	Social Studies 8 (2006)	**Cluster 1:** Understanding Societies Past and Present	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2013)	**Shape and Space:** Use direct or indirect measurement to solve problems	Section 4.2, Module 6
		Statistics and Probability: Collect, display, and analyze data to solve problems.	Section 4.2, Module 6
NB	Science 8 (2002)	**Unit 2:** Optics	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Unit 4: Cells, Tissues, Organs and Systems	Module 1, Module 3
	Social Studies 8 (1998)	**Theme One:** Physical Setting	Module 1, Module 2
		Theme Two: Culture	Module 2
		Theme Three: Economics	Module 2
		Theme Four: Technology	Section 4.2, Module 6
	Mathematics 8 (2009)	Patterns & Relations	Section 4.2, Module 6
		Shape & Space	Section 4.2, Module 6
		Statistics & Probability	Section 4.2, Module 6

NL	Science 8 (2012)	**Unit 3:** Optics	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Unit 4: Cells, Tissues, Organs and Systems	Module 1, Module 3
	Social Studies 8 (2005)	**Unit 1 – Introduction:** History as a Lens to the Past	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2015)	**Unit 6:** Linear Equations and Graphing	Section 4.2, Module 6
		Unit 7: Data Analysis and Probability	Section 4.2, Module 6
NS	Science 8 (2015)	**Physical Science:** Optics	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Life Science: Cells, Tissues, Organs, and Systems	Module 1, Module 3
	Social Studies 8 (2015)	**Unit Two:** Geographic Influences	Module 2, Section 5.1, Section 6.1
		Unit Five: Challenges and Opportunities	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2015)	**General Learning Outcomes:** Number, Patterns and Relations, Measurement, Geometry, Statistics and Probability	Section 4.2, Module 6
ON	Science and Technology (2008)	**Understanding Life Systems:** Cells	Module 1
		Understanding Structures and Mechanisms: Systems in Action	Module 3, Section 5.2, Section 6.2, Section 6.3, Section 6.4
	Mathematics (2005)	Measurement	Section 4.2, Module 6
		Geometry and Spatial Sense	Section 4.2, Module 6
		Patterning and Algebra	Section 4.2, Module 6
		Data Management and Probability	Section 4.2, Module 6
	History (2018)	**Strand A -** Creating Canada, 1850-1890	Module 2, Section 5.1, Section 6.1
		Stand B - Canada, 1890-1914: A Changing Society	Module 2, Section 5.1, Section 6.1
	Geography (2018)	**Strand A -** Global Settlement: Patterns and Sustainability	Module 2, Module 3, Section 5.1, Section 6.1
PEI	Science 8 (2016)	**Earth and Space Science –** Water Systems on Earth	Module 1, Module 3
		Physical Science – Optics	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Life Science – Cells, Tissues, Organs, and Systems	Module 1, Module 3
	Social Studies 8 (2006)	Geographic Influences	Module 2, Module 3, Section 5.1, Section 6.1
	Mathematics 8 (2009)	Patterns and Relations (PR)	Section 4.2, Module 6
		Shape and Space (SS)	Section 4.2, Module 6
		Statistics and Probability (SP)	Section 4.2, Module 6

QC	Elementary Mathematics, Science and Technology (2012)	**Earth and Space:** Matter	Module 1, Module 3
		Living Things: Matter	Module 1, Module 3
		Living Things: Forces and Motion	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Living Things: Systems and Interactions	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Living Things: Techniques and Instrumentation	Section 5.2, Section 6.2, Section 6.3, Section 6.4
	Elementary Social Sciences (2012)	Geography, History, and Citizenship Education	Module 2, Section 5.1, Section 6.1
SK	Science 8 (2009)	**Life Science:** Cells, Tissues, Organs, and Systems (CS 8.1, 8.2)	Module 1, Module 3
		Physical Science: Optics and Vision (OP, 8.1, OP 8.2, OP 8.4)	Section 5.2, Section 6.2, Section 6.3, Section 6.4
		Earth and Space Science: Water Systems on Earth (WS 8.1)	Module 1, Module 3
	Social Studies 8 (2009)	Dynamic Relationships (DR 8.1)	Module 2, Section 5.1, Section 6.1
		Interactions and Interdependence (IN 8.1)	Module 2, Section 5.1, Section 6.1
	Mathematics 8 (2008)	Number (N8.2, N8.3)	Section 4.2, Module 6
		Patterns and Relations (P8.1, P8.2)	Section 4.2, Module 6
		Shape and Space (SS8.1)	Section 4.2, Module 6
		Statistics and Probability (SP8.1)	Section 4.2, Module 6

TREE Modules Outline

Here we have outlined what you will find in our six TREE modules. These modules are online, can be downloaded, and are printed in a booklet, which is included in a TREE kit. The modules touch upon concepts that can help with student understanding as they progress to making sense of the data they receive. It is important to note that it is up to the teacher as to what modules they go through with students (although we suggest Module 2 to review instructions on creating the timeline and Module 4 as it has the sampling instructions!). As well, there are videos that accompany each of these modules that are available online at: http://bit.ly/TREE_page.

- **Module 1: Trees**
  - Module 1 addresses all things tree, from learning general tree anatomy, to identifying healthy and unhealthy trembling aspen, to understanding their various growing cycles.
    - o Section 1.1: Tree Anatomy & Functions
    - o Section 1.2: Trembling Aspen 101
    - o Section 1.3: Aspen Health
    - o Section 1.4: The Water Cycle
    - o Section 1.5: The Nutrient Cycle
  - Curricular connections: Science (Biology, Chemistry, Physics), Math, Indigenous Studies
  - Lessons: What Makes Up an Aspen, When an Aspen Gets Sick, Transpiration in Action Activity

- **Module 2: Local Context**
  - Module 2 addresses contextual information accompanying the samples, including site location and local history. This module encourages students to investigate the territory's Indigenous Knowledge, impact of human activity, and notable events in weather.

    > *This **timeline is essential** information required for data interpretation & must be provided with the samples.

    - o Section 2.1: Indigenous Knowledge & Uses of Trembling Aspen
    - o Section 2.2: Traditional Stories & Poems
    - o Section 2.3: Investigating Impacts on Local Forest (Creating the Timeline*).
    - o Section 2.4: Giving Back
  - Curricular connections: Social Studies, Indigenous Studies, Science (Biology, Chemistry, Physics), English Language Arts
  - Lessons: How do Aspen Contribute to Our Communities, Traditional Stories, Bringing Stories to Life, Poet and I Know It

- **Module 3: Soil**
  - Module 3 addresses all things soil, from identifying different soil horizons, to understanding the nutrient cycle of soil
    - o Section 3.1: Soil 101
    - o Section 3.2: Soil Horizons
    - o Section 3.3: The Nutrient Web
  - Curricular connections: Science (Biology, Chemistry, Physics)
  - Lessons: A Dirty Crossword

- **Module 4: Sampling**
  - Module 4* identifies the pieces of equipment in the TREE kit, how to use them, what kind of samples are needed, how to label the samples, and how to collect the samples.
    - o Section 4.1: What's in the Package?
    - o Section 4.2: Time to Collect Samples!
  - Curricular connections: Science, Math, Art
  - Lessons: Human or Tool? Who is More Accurate?

> *This module provides instructions to complete the TREE Sampling Form that **must be completed by the teacher and students and provided** with the samples.

- **Module 5: Labs**
  - Module 5 introduces the MAD Lab team members who are conducting a dendrochronological study and the CLS team members who are conducting an elemental analysis of the samples as well as providing educational support for the TREE program.
    - o Section 5.1: Mistik Askîwin Dendrochronology Lab
    - o Section 5.2: Canadian Light Source
  - Curricular connections: Math, Science (Biology, Chemistry, Physics)

- **Module 6: Data**
  - Module 6 discusses the data you will receive from the MAD Lab and CLS, how to interpret the data, how this data connects to the provided timeline, and some ideas on what to do with this data.
    - o Section 6.1: Dendrochronology
    - o Section 6.2: X-Ray Fluorescence
    - o Section 6.3: Interpreting Data Overview
    - o Section 6.4: Your Data
  - Curricular connections: Math, Science (Biology, Chemistry, Physics)
  - Lessons: Shrinking Tree Rings

How the Program Works

Listed below is a general outline of activities for participating in TREE. Remember that learning material is selected by the teacher all of our resources are online on the TREE website, and data from the samples is made publicly available.

- Learning material is available for teacher or student access as needed for your schedule
- Data is continuously available for module lessons and student investigation
- Teacher completes the registration form to access a sample collection kit
- CLS Education Team member contacts teacher and a TREE kit is booked
- Class is sent a kit with tools for sample collection
- Students research events in their community and create a detailed timeline of all events that might impact tree growth (natural or human events)
- Students collect samples from trembling aspen and nearby soil within their community
- Samples, sample form, and the timeline (electronic version preferred but printed version acceptable) are sent to the CLS and the MAD Lab for data analysis
- Data is shared with students and teacher once processing is complete *this timeframe is unpredictable - a report is provided as it becomes available*
- Data from samples is shared with the citizen science database

How to Register

To coordinate the mailout of the equipment required for sample collection, please fill out our Registration Form online or connect with CLS Education team (contact info below).

The TREE Kit containing the equipment, the samples of tree core & soil (accompanied by the sampling form), and a timeline of environmental events **are required for participation** and are to be sent to the address below (electronic versions preferred but print accepted).

The TREE Kit will be mailed out in a cardboard box and we ask that you **mail the Kit back in the box**, to help save on shipping. Don't worry though, as there is no cost to participating! A **Return Label** will be included with the box when it is initially mailed out to you. When you are ready to send the Kit back with the samples, you use the Return Label and drop it off at the courier service used to ship the kit to you.

If courier does not reach your community, we do have reimbursement options for shipping the Kit through Canada Post. Please keep your receipt and connect to the CLS Education staff member handling your Kit for more instructions.

If you have any questions, feel free to email or call the CLS Education Team.

Mailing Address:
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44 Innovation Blvd
Saskatoon, SK S7N 2V3

Email: education@lightsouce.ca
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About the Indigenous Languages & Traditional Knowledge Used in TREE

Throughout the TREE program, there is reference to various Indigenous languages and Traditional Knowledge across present-day Canada. According to Statistics Canada, more than 70 Indigenous languages are spoken throughout Canada; however, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) approximates this number as closer to 90. These statistics are a testimony to the diversity of Indigenous languages and Indigenous groups in Canada. It is also important to note the range of dialects that exist within these languages, the language family in which each language belongs to, and ways of knowing amongst each Indigenous group.

We currently have referenced languages and knowledge from a total of twelve Indigenous groups ranging from east to west. When referring to Indigenous groups and languages, TREE first cites the endonym (internal name) that Indigenous Peoples call themselves, followed by the exonym (external name used outside of the group) where applicable. We encourage you to use the endonym when teaching with resources by and about Indigenous Peoples. Indigenous Peoples referenced in this edition include the Anishinaabeg (Ojibwe, Chippewa, or Saulteaux), Dakelh (Carrier), Denesųłiné (Dene), Kanien'kehá:ka (Mohawk), Métis/Michif, Nakoda (Assiniboine), Nêhiyawêwin (Cree), Niitsitapi (Blackfoot), Innu (Montagnais), and Secwepemc (Shuswap).

Further information on the above-mentioned Indigenous groups and their languages:

Anishinaabemowin (Ojibwe, Chippewa, or Saulteaux): is spoken by the Anishinaabeg people whose territories range from the Great Lakes westward. In the English language, the Anishinaabeg people are often referred to as Ojibwe, Chippewa, or Saulteaux. Anishinaabemowin is one language, but within this language exist a range of dialects where words are spelled with slight variations. For example, different dialects include Anihsinapemowin or Nakawemowin (Plains Ojibwe/Saulteaux); Anishinaabemowin (Nippising Region); and Anishininimowin (Severn Ojibwe) (Belcourt, 2007).

Dakelh (Carrier): is an Athabascan language spoken in Dakelh Keyoh, a territory consisting of many lakes and rivers extending from the Coastal Mountains into the north-central interior of present-day British Columbia, and eastward towards the Rocky Mountains (Carrier Sekani Tribal Council, 2011). In their language, "Dakelh" means "People Who Travel Upon Water". According to the Canadian Encyclopedia (2018), a 2016 census estimated 1,265 Dakelh language speakers. Though we could not find a Dakelh word for "trembling aspen", Dakelh knowledge and traditional uses of trembling aspen is cited in Module 2.

Denesųłiné (Dene): is the name for the language spoken by the Dene people. Though Dene**s**ųłiné is one language, many dialects branch off including Akaitcho; Deh Cho; Gwich'in; Sahtu; and Tlicho. According to The Dene Nation (2018), "Geographical conditions in Denendeh *[The Land of the People]* have created the groups of people who make up the Dene Nation ─ Denesoline (Chipewyan), Tlicho (Dogrib), Deh Gah Got'ine (Slavey) K'ashot'ine (Hareskin) and Dinjii Zhuh (Gwich'in, once called Loucheux)". Dene**s**ųłiné is a member of the larger Athabascan language family and is spoken across a large area from the subarctic interior of Alaska, northwestern Canada, the plains of Southern Alberta, and extending into the southern United States (Dene Nation, 2018).

Kanien'kehá:ka (Mohawk): is an Iroquoian language spoken by the Kanien'kehá:ka People, which means "People of the Flint". There is an estimated 3,350 current Kanien'kehá:ka speakers in Canada and parts of the United States. There are six predominant Kanien'kehá:ka speaking communities across present-day Ontario (ON), Quebec (QC), and New York State (NY). These communities are Tyendinaga (ON), Wáhta (ON), Ohswé:ken (ON), Kahnawà:ke (QC), Kanehsatà:ke (QC), and Ahkwesáhsne (QC, ON, and NY) (Kanien'kehá:ka, n.d.).

Michif (Métis): is the name for languages spoken by Métis people, whose territories range from Ontario westward across the Plains, into parts of the Northwest Territories and the northeastern tip of British Columbia. The Michif language is half-Cree (an Algonquian language) and half-French (an Indo-European language). In this way, Michif is described as a syncretic language since it is not classifiable as belonging to a single language family but derives from the combination of two distinct cultures (Barkwell, L. J., Dorion, L., & Hourie, A., 2006). There is an estimated 1,170 fluent Michif speakers in Canada today (Statistics Canada, 2017).

Mi'kmaq (Micmac): is an Algonquian language spoken by the Mi'kmaq People. The Mi'kmaq are Indigenous to the Atlantic region of present-day Canada. According to Mi'gmawei Mawiomi Secretariat (2019), the traditional territory of the Mi'kmaq is known as Mi'gma'gi, and this greater territory consists of seven districts including Unama'gi, Esge'gewa'gi, Sugapune'gati, Epwegwitg aq Pgitu, Gesgugwitg, and Signigtewa'gi aq Gespe'gewa'gi. There are an estimated 8,870 Mi'kmaq speakers in Canada (Statistics Canada, 2017).

Innu-Aionun (Montagnais): is an Algonquian language spoken by the Innu, which means "The People". Innu territory is located on the eastern portion of the present-day Quebec-Labrador Peninsula. The Innu-Aionun language is closely related to the Nêhiyawêwin (Cree) language. Both Innu-Aionun and Nêhiyawêwin, as with many Algonquian languages, are polysynthetic languages meaning that sentences are composed of long, highly structured words and complex verbs (Native Languages, 2016). Statistics Canada (2017) estimates there are 11,360 Innu-Aionun speakers in Canada.

Nakoda (Assiniboine): is a Siouan language of the Northern Plains in present-day Canada and the northern United States. The term "Nakoda" means "friend" or "ally". Nakoda territory extends across parts of what is now Alberta, Saskatchewan, and Montana, with reserves in Saskatchewan and Alberta. There are an estimated 5,400 speakers in the Sioun language family (Statistics Canada, 2017).

Nêhiyawêwin (Cree): is the name for a language spoken by Nêhiyawak and Métis people. Nêhiyawêwin is a sub-language of the larger Alongquian language family (L. Burnouf, personal communication, June 6, 2016). Nêhiyawêwin is spoken in several dialects over a large geographical area in Canada. For example, in Saskatchewan, there are three dialects of Cree: Woodland Cree ("th" dialect), Swampy Cree ("n" dialect), and Plains Cree ("y" dialect). An example of how the dialects differ can be seen in the way each Cree language family identifies. The Woodland Cree refer to themselves as "níhithawak", the Swampy Cree as "néhinawak", and the Plains Cree as "néhiyawak" (Saskatchewan Indian Cultural Centre, n.d.).

Niitsitapi (Blackfoot): is one of the westernmost Algonquian languages and has been spoken for thousands of years in what is now Alberta, Saskatchewan, and Montana. The two main dialects are called Pikaniia and Siksika Blackfoot (Native Languages, 2016).

Secwepemctsin (Shuswap): is one of the Interior Salish languages of the larger Salishan language family. There are 43 consonants and 5 vowels in the Secwepemctisn sound system, and many of these sounds are not found in the English language. The current writing system for Secwepemticsin was developed approximately twenty years ago. Until then, Secwepemctsin was an oral language. In 1991, out of 7,597 members of the Secwepemc Nation, there were only 308 remaining speakers of the Secwepemctsin language (Matthews, 1999, as cited in Billy, 2009).

Nsyilxən (Okanagan): is an Interior Salish language spoken by the Syilx People of the present-day Okanagan Valley and extends into the United States. According to the Westbank First Nation, there are eight Syilx communities that speak this language including the Colville Confederated Tribes, Lower Similkameen Indian Band, Okanagan Indian Band, Osoyoos Indian Band, Penticton Indian Band, Upper Nicola Indian Band, Upper Similkameen Indian Band, and the Westbank First Nation (Westbank First Nation, 2019). There are an estimated 5,181 fluent nsyilxən speakers, which comprises 3.7% of the Syilx population. Though we could not find a Syilx word for "trembling aspen," Syilx knowledge and traditional uses of trembling aspen is cited in Module 2.

We again acknowledge the diversity and regional variations of dialects, spellings, and pronunciations within each language. Select translations for Plains Cree ("Y" dialect) has been provided by Kato Carriere (Cree-Métis) of Cumberland House, SK. Reference to the Denesųłiné language has been provided by Theresa Toulejour (Dene-Métis) of La Loche, SK. For a thorough compilation of resources cited in this overview or for further inquiry into language learning resources, websites, and smartphone apps, please see the References on the next page.

Language Resources

Below is a list of language resources for further inclusion within or beyond TREE. Where possible, we have included links to online dictionaries and smartphone or tablet apps. In the absence of a dictionary, we have provided links to history about the respective language and culture. If interested, please forward any other websites or informative resources with regards to Indigenous languages and knowledge systems you used with your engagement with TREE, to education@lightsource.ca.

Websites:
Blackfoot Dictionary: https://dictionary.blackfoot.atlas-ling.ca/#/help
Blackfoot Language and Culture Twelve-Year Program Kindergarten to Grade 12:
https://education.alberta.ca/media/563920/blackfoot-k-12.pdf
Dene History: https://sicc.sk.ca/dene-history/
FirstVoices: https://www.firstvoices.com/
Michif Dictionary by Gabriel Dumont Institute: http://www.metismuseum.ca/michif_dictionary.php
Nsyilxǝn Language: https://www.syilx.org/about-us/syilx-nation/nsyilxen-language/
Ojibwe People's Dictionary: https://ojibwe.lib.umn.edu/about-ojibwe-language
Online Cree Dictionary: http://www.creedictionary.com
The Aboriginal Languages of First Nations People, Métis, and Inuit: https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016022/98-200-x2016022-eng.cfm

Apps:
Learn an Indigenous Language offers a list of educational apps, compiled in the App Store, to help facilitate Indigenous language learning in Canada.
Whose Land? is an informative app designed to help users identify whose Indigenous territory you are situated on.

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