



Enhanced Nishnaabemwin Teaching

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November 20, 2024 Rainbow School District

Gchi-Miigwech

Huge thanks to Rand Valentine and Mary Ann Corbiere for letting me piggy-back on their dictionary work.

See my [Gchi-Miigwech](#) page for the many other people and institutions that have been involved at various other points.

Sincere apologies to anyone forgotten.



NATIONAL
ENDOWMENT
FOR THE
HUMANITIES



Goals



1. Showcase Nishnaabemwin Analyzer tool and garner responses to this tool
2. Experiment with teaching from stories
 - a. Stories provide copious sample sentences and grammatical forms to mimic
 - b. Stories provide cultural context for students learning Nishnaabemwin
3. Work towards developing readability/ complexity score for Nishnaabemwin books (aka Grade Level Appropriate Readers)
4. Practice using an analyzer to get more out of stories
 - a. Analyzer does grammatical analysis of words
 - b. Fine grained interaction with grammatical analysis possible
 - c. Higher level summaries that hide the grammar also available

Let's talk about language classes



What level (ability/age) of students do you teach?

Can students move from one school to another and cover same material?

What sorts of resources do you use?

Do you make the materials? Do you use published materials?

About grammar



When grammar is mentioned, people often groan inside (or out loud)

This is for good reason:

1. Babies learning language get no explicit grammar training
2. Grammar is pretty abstract
3. Learning grammar \neq speaking well

We have tried to make tools that leave grammar in the background

Ultimately, grammar-free classroom language learning is really hard

When teaching language, it is useful to be able to talk about it

So we will try to gently, gradually introduce grammar

About spelling



Spelling brings up a lot of thoughts:

It is unnatural: Nishnaabemwin has mostly not been a written language

It is difficult: communities often take centuries to represent sounds with consistent letters

It is judgmental: good spelling marks literacy > education -> intelligence

Trying to find a way to help you teach the language with existing tools

WAUWAUSSI-KOONAE

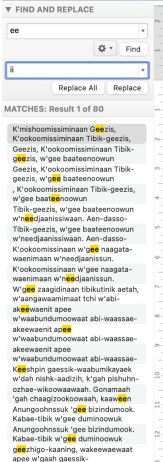
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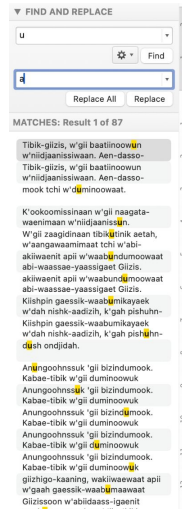
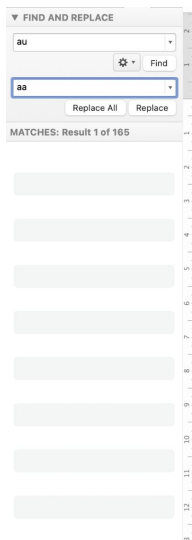
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English to Nishnaabemwin; Nishnaabemwin to English

Nishnaabemwin

🏠 Odawa & Eastern Ojibwe online dictionary

kwe' waachiyaa
hello kwei ta

walk

English to Nishnaabemwin Nishnaabemwin to English Advanced Options

📄 Results

📄 Credits

📄 Help

📄 Browse

walk *vt*

walk area of land

bimsaadaan *vti*

patrol sth. [within one's jurisdiction]

Wk (hist)

walk *vi* 49

arrive walking

bgamgaadewse *vai*

arrive walking

bgamse *vai*

arrive [walking]

arrive walking through snow

bgamaagne *vai*

arrive walking through the snow

bimsaadaan *vti*

patrol sth. [within one's jurisdiction] NOTE: (of an area of land)

INFLECTIONS

1s.IND **nbimsaadaan**

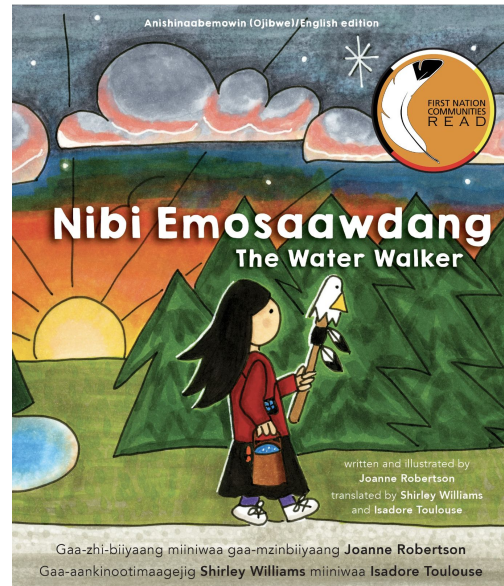
3s.CCNU **bemsaadang**

FULL VOWEL FORM

bimsaadan

WORD COMPONENT

bim *adv* by (direction), along, expanse, extent [e.g., land, time] 75



Teaching texts



If I had to teach Nishnaabemwin, I would have to use someone else's stories.

- Because I am not a speaker, and cannot make my own.
- Students need a model of what they should sound like.

I would not want to start explaining grammatical structures

- Students should learn to communicate, not dissect

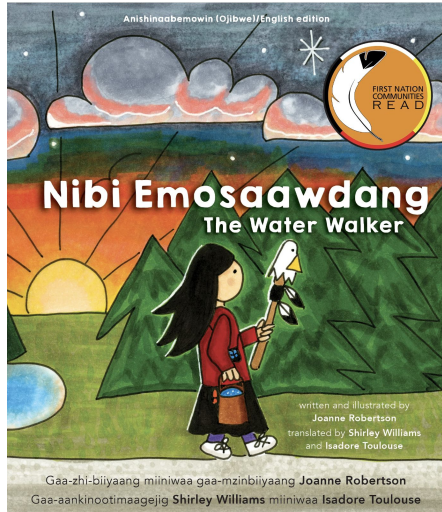
I would want to start with something simple, and work up to more complex topics

BOOZHOO! HELLO!

MANGESHIG PAWIS-STECKLEY



GAA-AAN'KINOOSDOOT TRANSLATED BY
MARY ANN CORBIERE



Nibi Emosaawdang The Water Walker

written and illustrated by
Joanne Robertson
translated by Shirley Williams
and Isadore Toulouse

Gaa-zhi-biiyaang miiniwaa gaa-mzinbiyaang Joanne Robertson
Gaa-aankinootmaagejig Shirley Williams miiniwaa Isadore Toulouse

Memengwan-kwens:

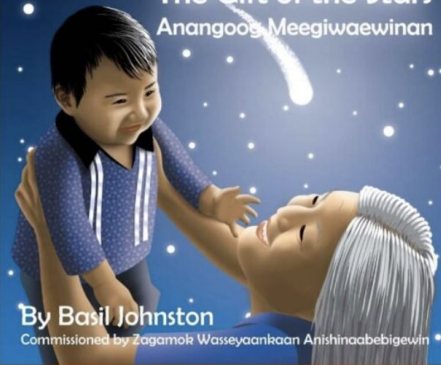
ENJI NAAGIDE'ENMINDWAA ANISHINAABE-BINODJIIN-
KINOOMAAGE-GAMIGOONG DIBAAJIMOWIN



ANISHINAABEBEK NATION

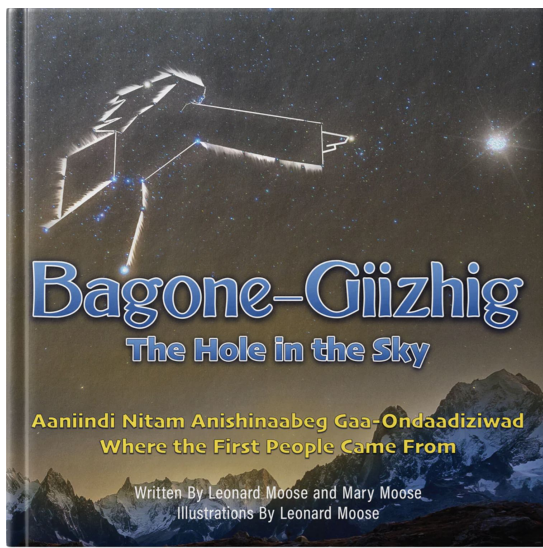
THE ANISHINAUBAEMOWIN SERIES

The Gift of the Stars
Anangoo Meegiwaewinan



By Basil Johnston

Commissioned by Zagamok Wasseyaanikaan Anishinaabegewin



Bagone-Giizhig The Hole in the Sky

Aaniindi Nitam Anishinaabeg Gaa-Ondaadiziwad
Where the First People Came From

Written By Leonard Moose and Mary Moose
Illustrations By Leonard Moose



Page 21

*Mii'ingiw g'izhaadigejig y'o
 baqoneyaq g'izhigoong. "O'kipsiwann-
 Awa ishkwanaadeg enlgeok, mii'ingiw
 i'iw wenji izhinoon uenabozho awidi
 binaadizowin wenji maaji'aaanget
 da mandadizimget awidi Akiing,
 abadok i'udis abaji'aaan A'ew
 asaabihosbi."*

Page 22

*Asabikeshiish o'ii gaganoo'yan
 ungo Nayan'zh mi'uluda, ikido
 A'napii, A'niimajayeg, g'awii'w
 g'egoo qida maaji'aaan mi'uluda
 g'awii'w g'egoo qida mikwendazim
 Nawa' g'ii A'yalayeg amaa g'izhigoong,
 me'q'ona dabshish bakann Aki'
 ishaayeg.*

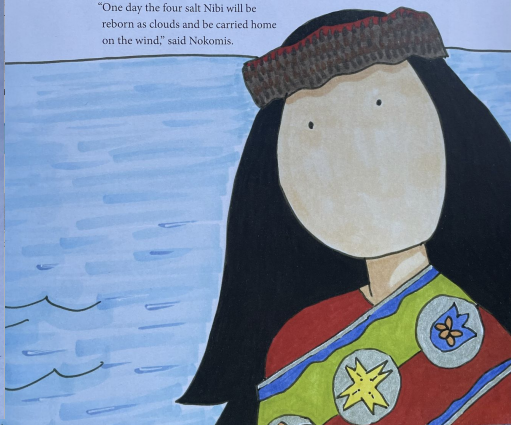
Ma'iingan nwaabmaa!
Boozhoo,
ma'iingan! Wegnesh
nwandman?
Ni'aa nnoondwaa ...

I see a wolf!
Hello, wolf!
What do you hear?
I hear ...

"Ngoding giizhigak nindan niwin ziitaagini-Nibi da ni aanji-ndaadizim gadoon dibishkoo aankwadoon miiniwaa da ni giitwe'aasinooon," gii-kida Nokomis.



"One day the four salt Nibi will be reborn as clouds and be carried home on the wind," said Nokomis.



Gii-ni dibikaaminaagod eshkam mii dash gii-maaj'taad wii-ni-giiwed, baamaa go zhiwe gaa-bi-zaagi-ninjiintaagwad enji jiigaakwaanig mii dash gii-depinogwad—mii go aw Anishinaaben-enkiitoowaajin gimaan! -gii-depinogwad—mii go aw Anishinaaben-enkiitoowaajin gimaan!

Memengwaan-kwens aani noondaagozi, giigbidoonenaa dash. Aanii mii-gaaza gewi, gaa dash go, zaam go gii-mididoon. Giigbiingwebpinogaazo gewi, gaawiin gii-waabzii. Aapji go gii-dibikaaminaagwad.

Gii-moozhaan daabaanan maajibizonid.



2 problems with texts



Texts are trying to tell stories ...

But learners need practice with patterns

Good stories don't usually hammer home simple patterns

Texts might come with a translation ...

But that only helps you generally understand what was said

Not how it was said, nor how to say something like it

Text readability



There are already ways to score how simple a story is.

English books get scored for readability or grade-level.

Several metrics exist, all measure average length of sentences and average length of words

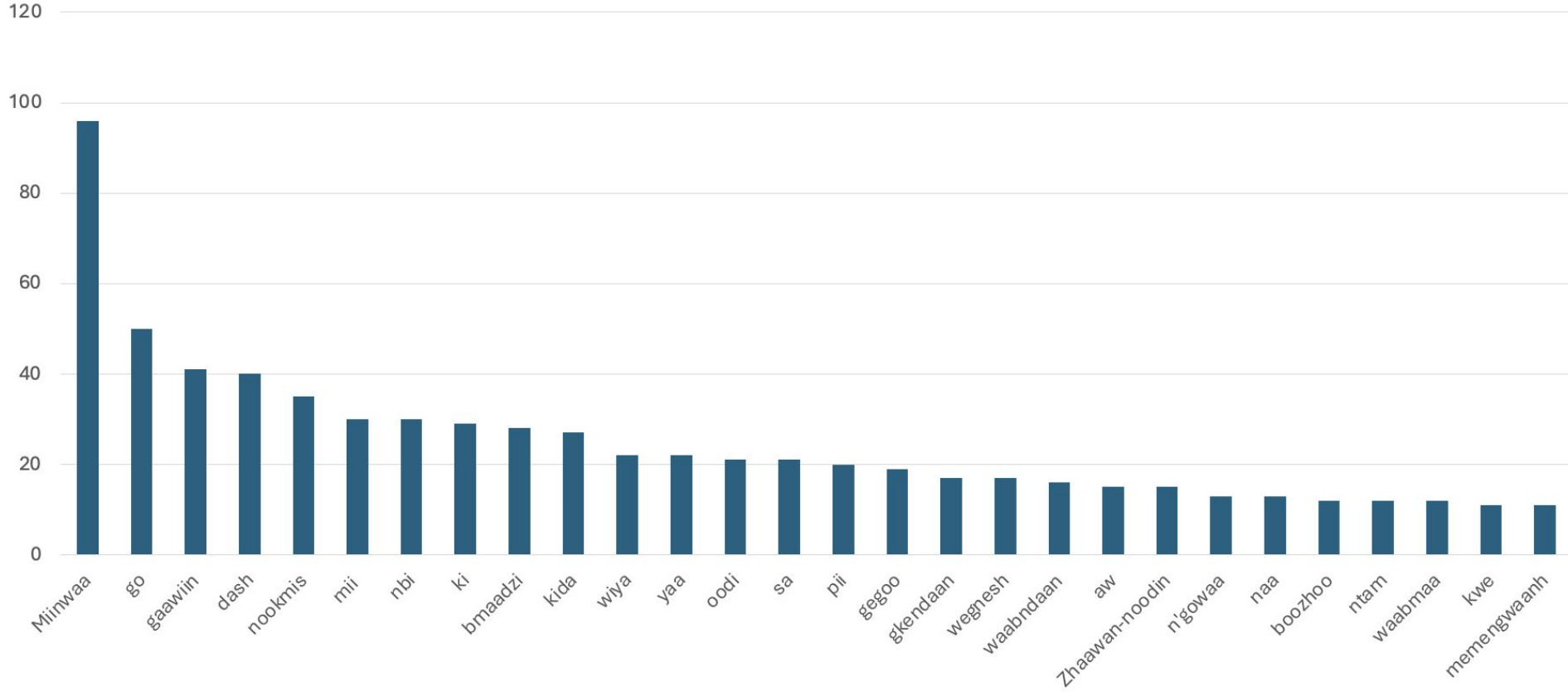
Primarily differ in how these components are weighted

Some also look for words that are unlikely to be known by a target group (e.g. 4th graders)

The Nishnaabemwin Analyzer can assign a complexity score to sentences and narratives



Most Frequently Occurring Words in the 5 Stories Chart



Conjugations of Frequently Mentioned Verbs

Bmaadzi (28) [VAI]	Kida (27) [VAI]	Gkendaan (17) [VTI]	Wiindmawaa (10) [VTA]
Bemaadizijig (4)	ikido (11)	Nigikendaan (1)	da-wiindamooninim (1)
Bimaadiziwin (6)	gaa-ikidoyeg (1)	Ogikendaanaawaa (1)	wiindamawish (1)
Da-bimaadiziwaapa 1	ikidowag (2)	Gii-ni-gkendaan (8)	gii-wiindmaagwan (1)
Da-bimaadiziyeg 1)	ikido (2)	gii-ni-gkendziin (1)	Gii-wiindmawaan (1)
Gii-bmaadziwaa 2	ikdo (1)	gii-gkendziin (1)	Gii-wiindmaagoon (1)
E-bimaadiziyeg 1	kidnid (1)	gkendzig (2)	gii-wiindmaagaazsii (1)
Waa-bimaadiziwaad 1	kidwan (1)	gii-ni-gkendaan (1)	gii-wiindmaagaaza (1)
Wiji-bimaadiziin (1)	gii-ni-kidwaad (1)	Ezhi-gkendzig (1)	wii-wiindmawaad (1)
Bmaadziwining (1)	gii-kidwan (1)	gaa-ni-gkendmaan (1)	Gii-bi-wiindmaagaaza (1)
Bemaadzijig (3)	Gii-kida (1)		gii-wiindmaagoon (1)
Bmaadziwin (1)	gii-kida (4)		
Eko-bmaadziyaanh (1)	kidwaad (1)		
Bemaadzinjin (1)			
Bimaadziwin (1)			

Flesch-Kincaid Scores



Readability Score:

- $206.385 - 1.015 (\text{total words}/\text{total sentences}) - 84.6 (\text{total syllables}/\text{total words})$
- Word length 83x more important than sentence length

Grade Level Score:

- $0.39 (\text{total words}/\text{total sentences}) + 11.8 (\text{total syllables}/\text{total words}) - 15.59$
- Word length 30x more important than sentence length

Easily Applicable



Flesch-Kincaid scores were designed for English, but formula works for any language

Even Nishnaabemwin!

Key feature: completely structure blind

You can get a quick idea of what stories are most accessible to a beginner

Or even which sentences in a story are most accessible

But Not Very Helpful



Huge underlying assumption of Flesch-Kincaid et. al:

- Readers already know English ... they are just learning how to read it

If you don't know the language, all that Flesch-Kincaid does is give a score to gibberish.

- Even the most “readable” text might as well have an infinite complexity score

Morphological Complexity Score



With lots of complicated words, you want to measure how much content is inside the words

- *Aabjichgan* 'tool' has as many syllables as *nimshensag* 'little dogs'
- But *nimshensag* is more complex: *nim(o)sh+ens+ag* 'dog+dim.+plural'

The analyzer detects content inside words

We can then count how much there is



6 Story complexity comparison

Story	Features per sentence
Nibi Emosaadang	32.6
Memengwan-Kwe	26.6
Bagone-Giizhig	25.0
Waawaaskone	15.9
Anangoog	15.0
Boozhoo	6.5
Overall mean	21.2



Interpreting morphological complexity scores

Substantially different texts got substantially different numbers

Boozhoo! is quite simple, and has the lowest score


Nibi Emosaawdang has long, elaborate sentences, and has the highest score

This is encouraging!

But there's more! We can rank sentences!

Complexity Score (Features per Sentence): 21.2

[Bowers-Corbiere Morphological Index]



Sentence	S	Sentence	S	Sentence	S
Gwaabmin ...	3	Gaa-zhi-nandone'aawaad asabikeshiinh.	4	Wegnesh nwandman?	5
Gmiwan	3	Akawe gida-nagidaan.	4	Boozhoo, aamoonyik!	5
Izhi-gwek niigaan.	4	Boozhoo, waawaashkesh!	4	nangoonsak gii-bzindamook.	5
"Mii inendaagog."	4	Mshiikenh gwaashkwebiigmitoot.	4	Gii-ni-wenaakshin.	5

“Nga-disig na binoojiins?”	9
Gga-odisgoon miinigoowiziwin.”	9
Anang gii-bnagoojin.	10
Gaawiin gego miinigoowiziwin gkendaagsinooon.	10
Gaawiin wiikaa gii-nishnaabemtaadsiiwag.	12
Aazhigo giizhaaknigeban wii-gnawenmaat	12
Gii-noondwaan kwezansan mwinid.	13
Gii-namaawag miinwaa gii-ngamtwaawaan Nbi.	13
Weshkad Zhaawani-noodin gii-maamkizaabmaan anangoon.	14
gookookoo debtaagzit dbaajmat dbikak?	14
Memengwaan-kwens aanwi-noondaagzi, gii-gbidoonenaash dash.	16
Mii go shkintam gii-waawiindizod eko-niizhtana-nsa-bboongag.	16

“Nga-disig na binoojiins?”	9
1+PV/ga+disaa+VTA+ThmInv na+Interj binoojiins+NA 'VTA S:3 O:1 PV/ga' 'Interj' 'NA'	9
Gaawiin gego miinigoowiziwin gkendaagsinoon.	10
gaawiin+Adv gego+Adv miinigoowiziwin+? gkendaagot+VII+Neg+0 'Adv' 'Adv' '?' 'VII S:0 Neg'	10
Gaawiin wiikaa gii-nishnaabemtaadsiiwag.	12
gaawiin+Adv wiikaa+Adv PV/gii+nishnaabemtawaa+VTA+Rcpl+VAI+Neg+3+3PI 'Adv' 'Adv' 'VAI (VTA>Rcpl>VAI) S:3PI Neg PV/gii'	12
Gii-noondwaan kwezansan mwinid.	13
3+PV/gii+noondwaa+VTA+ThmDir+3Obv kwezans+NA+Obv mwi+VAI+Cnj+3Obv 'VTA S:3 O:3Obv PV/gii' 'NA Obv' 'VAI S:3Obv Cnj'	13
Weshkad Zhaawani-noodin gii-maamkizaabmaan anangoon.	14
eshkat+Adv zhaa+VAI+NI+VII+Cmpd+noodin+NI gii-maamkizaabmaan+? nang+NA+Obv 'Adv' 'NI (VAI>NI>VII>Cmpd>noodin>NI)' '?' 'NA Obv'	14

<p>“Wegnesh geyaabi ge-zhichgeyaamba?” gii-gwiinwinendam Nokomis.</p>	20
<p>wegnesh+Pron+NA geyaabi+Adv ge-zhichgeyaamba+? PV/gii+gwiinwi-nendam+VAI+3 X+now+NAD+Cmpd+mko+NA+ThmPos+Pej+VAI 'NA (Pron>NA)' 'Adv' '?' 'VAI S:3 PV/gii' 'VAI (NAD>Cmpd>mko>NA>ThmPos>Pej>VAI) S:X'</p>	20
<p>Gii-bi-miinaa e-gnowaanig mjigoodenh miinwaa mkiznan wii-biiskang.</p>	22
<p>PV/gii+PV/bi+miinaa+VTA+ThmPas+VAI+3 e-gnowaanig+? mjigoode+NI+Con miinwaa+Adv mkizin+NI+Obv PV/wii+biiskaan+VTI+Cnj+3 'VAI (VTA>ThmPas>VAI) S:3 PV/gii PV/bi' '?' 'NI Con' 'Adv' 'NI Obv' 'VTI S:3 O:0 Cnj PV/wii'</p>	22
<p>Gii-nmetwaan niwi gaa-dbingaazjig ji-ni-dgoshnowaad endaawaad.</p>	26
<p>gii-nmetwaan+? niwi+Pron+NA PV/gaa+dbizhaan+VTI+Pass+VAI+Cnj+3+Pcp+3PI PV/da+ni-dgoshin+VAI+NI+VAI+Cnj+3PI PV/CCNJ+daa+VAI+Cnj+3PI '?' 'NA (Pron>NA)' 'VAI (VTI>Pass>VAI) S:3 Cnj Pcp (Focus:3PI) PV/gaa' 'VAI (VAI>NI>VAI) S:3PI Cnj PV/da' 'VAI S:3PI Cnj PV/CCNJ'</p>	26
<p>Gii-bijmaandaan nesewin miinwaa gii-ni-maamkaadendam bekaa zhayaa enji-mbaatenig miinwaa enji-gzhidenig biindig.</p>	35
<p>3+PV/gii+bijmaandaan+VTI nese+VAI+NI miinwaa+Adv PV/gii+PV/ni+maamkaadendam+VAI+3 bekaa+Adv zhi-yaa+VAI+3 PV/CCNJ+PV/nji+mbaabte+VII+Cnj+0Obv miinwaa+Adv PV/CCNJ+PV/nji+gzhide+VII+Cnj+0Obv biindik+Adv 'VTI S:3 O:0 PV/gii' 'NI (VAI>NI)' 'Adv' 'VAI S:3 PV/gii PV/ni' 'Adv' 'VAI S:3' 'VII S:0Obv Cnj PV/CCNJ PV/nji' 'Adv' 'VII S:0Obv Cnj PV/CCNJ PV/nji' 'Adv'</p>	35



Recap

Trying to teach from stories is not easy.

- The relevant sentences are probably scattered around in different places

- Very difficult to keep track of what is in all the sentences, where they are, how to progress

The complexity measure groups roughly similar sentences together

- You can then focus on one area, sift sentences according to a theme

Don't fret too much about small differences, because the analyzer isn't perfect

- The analyzer only caught about 80% of the words

- Quickly reviewed the output, and there were quite a few errors too



DIY



You can use the analyzer too!

Find it at this URL: <https://bowersd.github.io/textAnalysis/>

Morphological Analysis

[Gchi-Miigwech](#) [Background](#) [Contact](#) [Codes Explainer](#) [Nishnaabemwin Text Analysis](#) [Privacy](#)

0. Customize the analyzer cascade ...

Mark analyzers in order of priority, where 1 is highest priority. Leave unwanted analyzers blank.

The current options are "Rhodes", "Corbiere", and "No Deletion". "Rhodes" follows the 1985 dictionary by Richard Rhodes, "Corbiere" follows the Nishnaabemwin Online Dictionary by Mary Ann Corbiere and Rand Valentine, and "No Deletion" does not use vowel deletion.

- Rhodes
- Corbiere
- No Deletion

1. Select an analysis option below...

I want to get:

2. Type or paste Nishnaabemwin here:

3. Click this button:




Simple process

Small number of steps

1. Load page
2. Copy-paste text
3. Press “do it”

```
Nsing e-koozdeng gii-piitaagnagaa.  
Ggizheb dash ngii-naadin nbiish.  
Maa dash e-ndhamaang dkibi aabtaawaaki yaamgad, besho yaag nbis.  
E-ni-dgoshnaan wiinaagmi iw nbiish e-ndhamaang.  
Ge go dbi njijwang ge wii go bkwebiigmi.  
Maanoo dash go naa bngii aabtooshkin niimbaagning ngii-gwaabhaan.  
Ngii-maajiidoon endaayaang.  
Ngii-wiindmawaag, Gnabaj waya wesiinh yaadig maa ndahbaaning.  
Aw dash kiwenziinh gii-giigdo, Aanii dash?  
Mii dash gaa-nag, Waabndamog ow nbiish e-zhnaagwak.  
Aa nii nga-waabndaan, kido dash aw kiwenziinh.  
Gii-waabndaan dash.  
Mii dash ekdod, Jibwaa niizhgon'gak wii-bi-gchi-nimkiikaa.  
Ngii-maajaa dash ge-nokiiyaan.  
Miinwaa gaa-waabang eshkam gii-aabwaa.  
Mii dash e-naagshig eshkam gii-gchi-aabwaa.  
Ge go mii gii-waabndamaan waasmowaad giw Nimkiig.  
E-ni-dbikak mii gii-noondwangdwaa Nimkiig, ge go gii-gchi-nimkiikaag.  
Gegzhebaawgak goon kina gii-ngaabaawe.  
Mii eta nbiish gaa-bmijwang gegzhebaawgak.
```

3. Click this button: 



And results

Boom!

(You might get a slow tab warning)

Overall Score (Features per Sentence):	19.7
gii-shpaagnagaa	4
gnimaa oodetoodig ngii-ig	6
mii dash gii-gwaabiignid	6
gye go ngii-giiskon'yebnig	6
mii dash gii-boozyaan	6
gii-waabndaan dash	6
megwaa sa ggiziibiigsagnige	7

Customizable

You can pick what type of analysis you want:

1. Full analysis -a battery of analyses for each word
2. Frequency count -tabulate most often used words
3. Complexity sort -morphological feature count
4. Verb sort -sort by similar verbs
5. Verb collation -extract all verbs of same type
6. Unanalyzed words -if you really like sweat and toil

1. Select an analysis option below...

I want to get: full analysis (interlinear)

2. Type or pas full analysis (interlinear)

frequency count

sentence sort (by complexity)

sentence sort (by verb type)

verb collation

unanalyzed words (alphabetical)

unanalyzed words (alphabetical from end)



Tour of verb sort

Main idea: Group sentences by description type

Also, group things that take the same suffixes

Main description types:

Action/description of a thing (VII)

Action/description of a being (VAI)

Acting on a thing (VTI/VAIO)

Acting on a being (VTA)

Sentences containing multiple verb types get duplicated!

>> These sentences have verbs of the following category: VTA

ngii-noopnanig ngii-nendam

gaawaanh dash ngii-debbinig

bzagaakoog ngii-aawnaanaanig

gmaapii miinwaa ngii-waabmaa

mii dash gii-nkwetwid

ngii-bgidnigoog dash da-zhaayaan

mii dash gii-gnoonag



Tour of verb collation

Verb sort does not isolate the verbs

Verb collation extracts the verbs

Verb sort ordered sentences w/in each category by feature count

Verb collation orders by what is encoded in affixes

Probably badly

Found these verbs of category VAI:

waabshkokiing

waabshkokiing

ngii-zhiwnigoo

ngii-ggwejmigoo

e-gii-zhiwnigooyaang

gii-miin'gooyaang

gii-zhiwnigooyaang



Tour of full analysis

This is the bedrock under the other analyses

Every sentence gets a multi-layered analysis

1. Narrow grammatical analysis
2. Broad grammatical analysis (more readable)
3. NOD header
4. Terse English translation of NOD definition

Original Material:	gaa	wii	ngii-nwesii	enwewaad
Narrow Analysis:	gaa+NA	wii+Interj	1+PV/ gii+nwe+VAI+Neg	PV/ CCNJ+nwe+VAI+Cnj+3PI
Broad Analysis:	'NA'	'Interj'	'VAI S:1 Neg'	'VAI S:3PI Cnj PV/CCNJ'
NOD Header:	gaa	wii	nwe	nwe
Terse Translation:	'no/ pickerel'	'darn/it'	'articulate'	'articulate'



Meta-Customizable

Choose how things should be spelled

- Rhodes (following the Rhodes dictionary)
- Corbiere (following the Nishnaabemwin Online Dictionary)
- No Deletion (as if vowel deletion never happened)

<input type="text" value="1"/>	Rhodes
<input type="text"/>	Corbiere
<input type="text"/>	No Deletion

Rank them in the order that you want them to be used

LIMITATION: These are strict analyzers

They require near flawless spelling

Plans to add relaxed analyzers, but it isn't easy



Explainers for grammatical codes

Morphological Analysis

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See below for lists of grammatical codes produced by the analyzer. The codes are alphabetized, and broken into sections by whether they appear in both narrow and broad analyses, just in narrow analyses, or just in broad analyses. Please be patient, it will take a moment for the tables to load.

Here are codes that appear in both narrow and broad analyses:

Code	Technical Definition	Informal Explanation
0	Inanimate	it, a thing
0Obv	Inanimate obviative	the other thing, disambiguation of inanimate third persons
0Pl	Inanimate plural	many things
1	First person	I/me/my...



Pro-tips

Tag sentences with their page numbers before you run the complexity sort!

Excel is really useful for this (enter numbers in an adjacent column, copy both columns)

Put each sentence on a new line!

Keep the English translations handy



So go forth and explore!

As a little present, I put together a few sets of sentences from Andrew Medler's book

These were spelled very consistently by Leonard Bloomfield and transliterated by Rand Valentine

So use the Rhodes analyzer

What sort of lesson will you put together with your set?



Contact

This took a lot of work, and there is so much more to do.

You may find an error, or want a feature, or have something nice to say

Please don't be shy!

My contact information is on the page

Also here: dustin.a.bowers@proton.me

I will also put the slides up on my website: <https://bowersd.github.io>



Would it be useful if?

There were analytical options that targeted nouns?

Verb sort highlighted the verbs?

Spelling suggestions were given?

Sentences were detected automatically?

English translations could be supplied (automatic translations are way in the future)?

Indices of sentence location were calculated and displayed?

Summary statistics were shown (which models analyzed what, how many verbs, how many X, etc)?