EAST CREE MATHEMATICS

TERMINOLOGY WORKHOP REPORT

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Table of Content

1. Measurement in Traditional Activities
2. Classifying objects into sets and subsets using Cree classifiers
3. Reduplication and Distributivity
4. Division
5. Geometry
Appendix A, B, C, D

Note: - English-Cree terminology *is in another document*

1. Measurement in Traditional Activities

Measurement in traditional activities often involved the human body. For example: using hands, arms, feet or fingers to measure something.

ᑎᐱᓂᖏᑌᐤ- measuring the size of a fish net using your arms. You have to hold the string in the palm of your hand, which covers the length up to your fingertips.

ᐯᖻᑯᓂᑦ or 2 ᑎᐸᖅᑯᓂᒃᖾᐦ- 1 arm to the other arm length

ᐊᑭᐱᓂᑦ or 1 ᑎᐸᖅᑯᓂᒃᖾᐦ- 1 from the chest to the length of the arm

ᑎᐱᓂᖅᒉᑎᒻ	tipiniskaatim using arms, measurement net, snowshoes, string-like things, toboggan
ᑎᐱᓂᖅᓯᓂᒻ	tipinischaanim using hand for measurement snowshoes, crossp-bars,
ᑎᐱᓯᒋᐦᑎᒻ	tipisitaahtim using feet for measurement

Activity 1.

When you take a string and measure from the end of one arm to the end of the other arm, the length of the string will be equal to your height.

Activity 2.

When you take a string and measure your head, turning the string 3 times around, it will be the same length as your height. Start measuring from your forehead.

Cree has many numeral words that are used to count and indicate size, weight, volume, time in a very concrete way. See for example the list of words with number *neu* (four) in **Appendix A**

2. Classifying objects into sets and subsets using Cree classifiers

The Cree language has a series of classifiers, also called "concrete finals", which indicate the concrete properties of objects, as they are manipulated by people. These properties are essential to the survival on the land. The name of many objects (and events) naturally form sets determined by the category indicated by the classifier.

Cree concrete finals (Southern)

-ᐊᐦᑎᑯ	-aahtikw	*stick-like*
-ᐊᐢᑯ	-aaskw	*stick-like*
-ᐊᐩ (ᔭᐩ)	-aapii -yaapii	*string-like*
-ᐊᐱᐢᓴ	-aapisch	*hard (metal, stone, glass)*
-ᐊᐱᐢᑯ	-aapiskw	*hard (metal, stone, glass)*
-ᐊᐣ	-aapuu (I)	*liquid*
-ᐊᐳᐃ	-aapui(C)	*liquid*
-ᒋᐧᐊᐦᐠ	-chiwaahp	*tent/teepee*
-(ᐁ)ᒋᐣ	-(e)chin	*sheet-like*
-ᑲᒥᑯ	-kamikw	*structure*
-ᑲᐣ	-kaan	*man-made, manufactured*
-ᒥᐣ	-min (C)	*berry*
-ᒥᓂᐣ	-minaan (I)	*berry*
-ᐢᑲᒥᑯ	-skamikw	*moss, earth*
-ᐢᑎᑯ	-stikw	*river*
-ᔭᐣ	-yaan	*sheet-like*

Cree concrete finals (Northern)

-ᐊᐦᑎᑯ	-aahtikw -yaahtikw -waahtikw	*stick-like*
-ᐊᐢᑯ	-aaskw	*stick-like, branch*
-ᐊᐱᐢᑯ	-aapiskw	*hard (metal, stone, glass)*
-ᐊᐱᐢᓴ	-aapisch	*hard (metal, stone, glass)*
-ᔭᐣ	-yaan	*sheet-like*
-ᐊᐳᐃ	-aapui	*liquid*
-(ᔭ)ᐊᐩ	-(y)aapii	*string-like*
-ᐯᒥᑯ	-kimikw	*structure*
-ᒋᐧᐊᐦᐠ	-chiwaahp	*shelter*
-ᐦᑲᐣ	-hkaan	*made, manufactured*
-ᐢᐯᒥᑯ	-(i)skimikw	*moss, earth*
-ᓯᐦᐨ	-siht	*branch*

-ᒥᓄ	-min	*berry*
-ᔪᑎᑯ	-shtikw	*river*

Examples (Southern):

ᑭᕀ<ᐩᑲᐤ	<<ᐩᑲᐤ	(sheet-like)
ᑭᕀ<ᐩᑲᔪᓄ	<<ᐩᑲᔪᓄ	(stick-like)
ᑭᕀ<ᐩᑲᔪᓱ	<<ᐩᑲᔪᓱ	(wood-like)
ᑭᕀ<ᖃᐩᓄ(ᑭᕀ<ᖁᐩᓄ)	<<ᖃᐩᓄ	(material-like, paper-like)
ᑭᕀ<ᑭᓱ	<<ᑭᓱ	(hides-moose, caribou, ice, clothing)
ᑭᕀ<ᐩᐱᕀᐩᑲᐤ	<<ᐩᕀᐱᕀᐩᑲᐤ	(metal-like)
ᑭᕀ<ᐩᐱᕀᑭᓱ	<<ᐩᐱᕀᑭᓱ	(metal-like)

Examples (Northern)

ᐊ>△ + -ᐊᐧᑎᑯ	ᐊ>ᐳᐧᑎᑯ	apui + -aahtikw	apuiyaahtikw	*paddle + stick-like = paddle stick*
ᐊ·<ᓀᓄ + -ᐊᕀᑯ	ᐊ·<ᓀᓭᕀᑯ	apwaan + -aaskw	apwaanaaskw	*roasted meat + stick = roasting stick*
ᐊᒥᕀᑯ + -ᐊ>△	ᐊᒥᕀ·ᐩ>△	amiskw + -aapui	amiskwaapui	*beaver + broth = beaver broth*
·ᐊ>ᔪ + -ᐊ>△	·ᐊ>·ᓱ>△	waapush + -aapui	waapushwaapui	*rabbit + broth = rabbit broth*
ᐊᑎᐧᑯ + -ᐊ>△	ᐊᑎᐧ·ᐩ>△	atihkw + -aapui	atihkwaapui	*caribou + broth = caribou broth*
ᐅ·<ᒪᓄ + -ᓰᑭᓄ	ᐅ·<ᒥᓰᑭᓄ	upwaam + -chaakin	upwaamichaakin	*thigh + bone = thigh bone*
·ᐊᐦᓂᐧᑕᑭᓄ + -ᐊᐱᕀᑯ	·ᐊᐦᓂᐧᑕᑭᓭᐱᕀᑯ	waasaanihtaakin + -aapiskw	waasaanihtaakinaapiskw	*window + glass = windowpane*
ᒪᐧᑭ + -ᐊᑭᓄ	ᒪᐧᑭᐳᑭᓄ	maahkii + -aachin	maahkiiyaachin	*tent + cloth = canvas*
ᒪᐧᑭ + -ᐊᐧᑎᑯ	ᒪᐧᑭᐳᐧᑎᑯ	maahkii + -aahtikw	maahkiiyaahtihkw	*tent + stick = tent frame*

·△ᓂ"ᐊᑭᓵ + - ᐊ"ᑎᑯ	·△ᓂ"ᐊᑭᓱ" ᑎᑯ	winihiikin + - aahtikw	winihiikinaahtikw	*trap + stick = stick for trap*
△"ᐊᐱ"ᑲᓵ + - ᐊ"ᑎᑯ	△"ᐊᐱ"ᑲᓱ" ᑎᑯ	ihiipihkaan + - aahtikw	ihiipihkaanaahtikw	*fishnet +stick = netting needle*

Activity 3.
Display a number of objects on a table in the classroom. Name the objects in Cree, so that the children hear the word with its classifier. Then, ask the children to organize them by in logical sets.
For example:

1. Display some embroidery thread, a shoelace, some wool, a diaper, an undershirt and a seal skin: these represent 3 -yan objects, 3 - aapii objects: ask the children to arrange them in two sets of three, by finding something in common. Let the children touch and manipulate the objects.

Set one

ᓂᒪ"ᒋᐅᐱ"ᑭᑲᓂᔨᐊ	maamaahtaaupihchikaniyaapii	embroidery thread
ᒪᐟᑭᓯᓂᔨᐊ	maschisiniyaapii	shoelace
ᒥᒋᓯᔨᐊ	mitaasiyaapii	wool

Set two:

ᐊᓯᔨᓵ	aasiyaan	diaper, pamper
ᐱ"ᐧᐳᒍᔨᓵ	piihtuupachuyaan	undershirt
ᐊ"ᑭᑯᔨᓵ	aahchikuyaan	sealskin

2. Increase the size and complexity of the exercise: put -(e)chin objects, -aapii objects, -aahtikw or -aaskw objects, and -aapisch or -aapiskw objects. These should go in 4 different sets, maybe even 6 if they pay really attention to the words endings.

Discuss with the children the reasons why they classify some objects together. The children could create all kinds of unexpected categories (by colour, by texture, by size, etc.)
Make them discover that these objects all have a name in Cree with a part that sounds the same.

Note: The same exercises can be applied to more abstract differences in the language, like creating sets for animate and inanimate things, doing the test with waapatham... vs waapameu... Subsets could be created combining animacy and classifiers: for example -yaapii words that are animate, and -yaapii words that are inanimate.

Activity 4. Create a memory game with cards representing written words or objects. Decide if the whole word/object has to match or if it is enough that the classifier matches before you play.

Activity 5. Look for subsets into a classifier set.
For example, mix up all words in -yan, and then classify them according to whether they refer to animal pelts or clothing.
Examples:

ᐁᓄ

ᐧᐊᐳᓴᐁᓄ
ᐊᒥᔨᔪᐁᓄ
ᒍᔪᐁᓄ
ᒥᐟᐧᑐᓴᐁᓄ
ᐊᑎᐟᔪᐁᓄ
ᐧᐊᐱᔆᓭᓄᐁᓄ
ᑭᖏᐁᔪᐁᓄ (ᑲᔪᓴᐁᓄ)
ᔑᑯᔪᓴᐁᓄ
ᐊᒋᑲᓴᐁᓄ
ᓂᔪᐃᓴᐁᓄ
ᔑᐟᑲᔪᐁᓄ
ᓂᑭᔪᐁᓄ
ᐱᓴᐁᓄ
ᒪᐟᐃᐟᑲᓄᐁᓄ
ᐧᐃᓂᔆᔪᐁᓄ
ᐧᐊᑭᔆᔪᐁᓄ
ᐅᑫᔪᐁᓄ
ᐧᐃᐱᔪᐁᓄ
ᐧᐃᐱᒍᐁᓄ
ᐊᔆᐁᓄ
ᐧᐊᐸᑫᔪᐁᓄ

ᐃᐟᐢᐊᐟᐢᐊᐟᐢᐊ

ᐊᐅᓄᑦ (ᐊᐅᓂᑦ)
·ᐊᐅᓴᓄᑦ (·ᐊᐅᓴᓄᑦ)
ᐊᓐ·ᑫᔪᒍᓄᑦ (ᐊᓐ·ᑫᔪᒍᓂᑦ)
ᐱᕋᔪᑲᓄᑦ (ᐱᕋᔪᑲᓂᑦ)
ᒪᑎᕐᓄᑦ (ᒪᑎᕐᓂᑦ)

ᐊᒥᐠᑯᓴᑦ	amiskuyaan	beaverskin
ᔪᑲᑯᓴᑦ	shikaakuyaan	skunkskin
ᐊᒼᑭᑯᓴᑦ	aahchikuyaan	sealskin
·ᐊᐱᐠᑯᓴᑦ	waapiskuyaan	polar bearskin
(ᐊ)ᓂᑯᒪᔪ·ᐃᓴᑦ	(aa)nikuchaashiwiyaan	squirrelskin
ᐊᑎᒼᑯᓴᑦ	atihkuyaan	caribouhide
ᒧᔭᓴᑦ	muusuuyaan	moosehide
·ᐃᑭᓇᑯᓴᑦ	wichishkuyaan	muskratskin
ᔪᒼᑯᔪᐅᓴᑦ	sihkusiuyaan	ermineskin
ᓂᑭᑯᓴᑦ	nichikuyaan	otterskin
·ᐊᐱᓇᑦᓂ·ᐃᓴᑦ	waapishtaaniwiyaan	martenskin
ᐱᔪ·ᐃᓴᑦ	pishiwiyaan	lynxskin
ᑲᑭ·ᐃᓴᑦ (ᐊᒼᑲᓭᔪᑭᑦ, ᕿᑯᑎᒪᑭᑦ)	kaachiwiyaan (aahkaanaasikin, paakutimaakin-freeze-dried hide)	raw caribouhide/moosehide
·ᐊᐅᓇᓴᑦ	waapushuyaan	rabbitskin
ᑭᓱᓴᑯᓴᑦ	chishaayaakuyaan	bearskin
ᐊᑭᑲᔪ·ᐃᓴᐊᑦ	achikaashiwiyaan	minkskin
ᓂᕿ·ᐃᓴᑦ	nipaawiyaan	nightgown
ᒥᒼᐃᑭᓂ·ᐃᓴᑦ	mihiikiniwiyaan	wolfskin
ᒪᓴᑭ·ᐃᓴᑦ	maayaachiwiyaan	tanned hide (commercially)
ᒪᓂᓐᓄᓂᔪ·ᐃᓴᑦ	maanishchaanishiwiyaan	sheepskin
ᐱᑭ·ᐃᓴᑦ	pichiwiyaan	cloth
·ᐊᐅᓴᑦ	waapuyaan	blanket
·ᐊᐅᓴᓭᑭᑦ		
ᐊᑯᒼᕿᑭᑦ	waapuyaanaachin	material for blankets
ᕿᑎᑯᕿᑭᑦ	akuhpaachin	material for dresses/skirts
ᐊᐱᒼ·ᑲᓯᓭᑭᑦ	paatikutaachin	flannelette
ᒪᒼᑭᓴᑭᑦ	apihkwaasunaachin	material for coverings
ᒥᑦ·ᐊᑭᑦ	maahkiyaachin	material for tent
ᐅᑦᑕᑭᑦ	michiiwaachin	bandages
ᓂᑎᒼᑯᔪᓭᑭᑦ	uutaachin	canvas for canoes
ᐊᑯᓂᒼᐃᑭᓭᑭᑦ	nitihkuyinaachin	bandages
ᒥᓯᓂᒼᐃᑭᓭᑭᑦ	akunihiikinaachin	tarpaulin
	misinihiikinaachin	paper

ᐊᐱ"·ᑲᓇᒋᓐ	apihkwaanaachin	roofing material
ᒥᔾᒋᓴᓇᒋᓐ	mischisinaachin	sole (moccasins)
ᓂ·ᑲᓇᔭᐱ	nikwaanaayaapii	snare wire/string
ᐱᓱᒋᓇᐱ	piishaakinaapii	string (leather string)
ᒥ"·ᑲᔭᐱ	mihkwaayaapii	blood vein
ᐃᔅᔪᑦ·ᐊᔭᐱ	iishkutaawaayaapii	electrical wire
ᐊᔾᒋᒥᓇᔭᐱ	aschiminaayaapii	babiche for snowshoes
ᐅᑌᓂᑦᔭᐱ	uchaashtaayaapii	tendon
ᒥᑐᓇᔭᐱ	mitunaapii	babiche for middle hole
ᔅᓱᔾᑎ·ᑲᔭᐱ	shaashtikwaayaapii	sisal rope
ᑭᔾᑕ·ᑲᔭᐱ	kischikwaasuwinaayaapii	thread
ᑭᔾᒋᓴᐧ·ᐃᓇᔭᐱ	waaukinaayaapii	spinal cord
·ᐊᐅᑭᓇᔭᐱ	mishinishtihiikinaayaapii	embroidery thread
ᒥᔑᓂᔾᑎ"ᐃᑭᓇᔭᐱ	mitaasaayaapii	yarn
ᒥᑦᓴᔭᐱ	astisaayaapii	braided cord for mittens
ᐊᔾᑎᓴᔭᐱ	mischisinaayaapii	shoelace
ᒥᔾᒋᓴᓇᔭᐱ	utaapaanaayaapii	string for toboggan
ᐅᑦᐸᓇᔭᐱ	miiutaayaapii	tumpline
ᑎᐅᑦᔭᐱ	aahchikwaayaapii	sealskin rope
ᐊᐪᑭ·ᑲᔭᐱ	sikipwaanaayaapii	string for roasting
ᔪᑭ·ᐸᓇᔭᐱ	chishtaapaauchikinaayaapii	clothesline
ᑭᔾᑦᐸᐅᒋᑭᓇᔭᐱ	uchikwaachikinaayaapii	fishing line
ᐅᒋ·ᑲᒋᑭᓇᔭᐱ	utinaakinaapii	pulling line for net
ᐅᑎᓇᑭᓇᐱ	waaspisuwiyaanaayaapii	string for mossbag
·ᐊᔾᐱᓂ·ᐃᔭᓇᔭᐱ	maamaapisunaayaapii	string/rope for swing
ᒪᒪᐱᓂᓇᔭᐱ	waashtaanimaakinaayaapii	electrical wires
·ᐊᔪᑦᓂᒪᑭᓇᔭᐱ	kuskinaapii	nightline
ᔨᔾᑭᓇᐱ	tipihiikinaayaapii	measuring tape
ᑎᐱ"ᐃᑭᓇᔭᐱ	uchipichikinaayaapii	starter cord
ᐅᒋᐱᒋᑭᓇᔭᐱ	pichiwinaayaapii	cloth string
ᐱᒋ·ᐃᓇᔭᐱ	saachipitwaanaayaapii	braid
ᐊᒋᐱ·ᑦᓇᔭᐱ	waapushuyaanaayaapii	rabbitskin cord/string
·ᐊᐳᓂᔭᓇᔭᐱ	ashtutinaayaapii	string/cord for hat
ᐊᔪᑐᑎᓇᔭᐱ	muuhkutaakinaayaapii	string wound around
ᒧ"ᔨᑦᑭᓇᔭᐱ	atimwaayaapii	crooked knife
ᐊᑎ·ᒪᔭᐱ	waachaayaapii	harness rope for dogteam
·ᐊᐃᓴᔭᐱ	chiishtaakihiikinaayaapii	watch band
ᑭᔪᑦᑭ"ᐃᑭᓇᔭᐱ	sichihtipihkwaanaayaapii	string for tent stakes
ᔪᑎ"ᑎᐱ"·ᑲᓇᔭᐱ	chiischinihkunaayaapii	string for canvas covers
ᑭᔾᑭᓂ"ᔨᓇᔭᐱ	sichipitihtaakinaayaapii	moccasin strings
ᔪᑎᐱᑎ"ᑦᑭᓇᔭᐱ	misiputaakinaayaapii	string for attaching beaver skin to frame
ᒥᔪᐳᑦᑭᓇᔭᐱ	winihiikinaayaapii	string to pull moosehide while softening
·ᐃᓂ"ᐃᑭᓇᔭᐱ		

ᐱᔨᐱᓴᐧᑲᔨᐯ	piyaapiskwaayaapii	string/metal chain for attaching trap
ᐄᓯᐧᒪᔨᐯ	piisimwaayaapii	metal wire sunbeam
ᐊᐳᒧᐧᐊᔨᐯᐧᐊᔨᐯ	ayimuwaayaapiiwaayaapii	radio antenna
ᐧᐊᓂᑭᔪᑭᓲᔨᐯ	waashkishikinaayaapii	
ᓱᑎᒪᐅᔨᓲᔨᐯ	sichimaauyaanaayaapii	
ᒥᐦᑌᔨᐯ	mihtuyaayaapii	string for mosquito net
ᐱᔮᒥᓲᔨᐯ	pishiminaayaapii	string for harpoon
ᐃᔨᔨᐯ	iiyaayaapii	snowshoe babiche binding leather string i.e. moose
ᐱᐧᔨᐱᓴᐣ	piywaapiskw	
ᐧᐊᐄᓂᖅᑭᑭᓲᓴᐣ	waasaanihtaakinaapiskw	metal
ᓀᐧᐃᔨᓲᐱᓴᐣ	shuwiyaanaapiskw	window pane/lamp glass
ᒥᓲᐱᓴᐣ	minaapiskw	precious metal
ᐧᐊᓲᐱᓴᐣ	wiyiywaapiskw	rocky outcrop
ᐧᐃᓂᐧᔨᐱᓴᐣ	usaawaapiskw	quartz
ᐅᐄᐧᐊᐱᓴᐣ	iiyiyihpiskw	yellow rock??
ᐃᓂᓂᖅᐱᓴᐣ	chishtuhkinaapiskw	healing stone
ᑭᓐᑭᖅᓲᐱᓴᐣ	paaschisikinaapiskw	doorknob
ᐸᐣᑭᓯᖅᓲᐱᓴᐣ	pihkutaawaapiskw	gun barrel
ᐱᖅᔨᑕᐧᐊᐱᓴᐣ	chisaapischisaawaanaapiskw	metal for fireplace
ᑭᐄᐱᐣᑭᐄᐧᐊᓲᐱᓴᐣ	muuhkutaakinaapiskw	metal used for stoves
ᒍᖅᔨᑕᖅᓲᐱᓴᐣ	chiikihiikinaapiskw	metal for crooked knives
ᑮᑭᖅᐃᖅᓲᐱᓴᐣ	sinikuhiikinaapiskw	axe (metal)
ᓱᓂᔨᐃᖅᓲᐱᓴᐣ	mishchiishikwaapiskw	file (metal)
ᒥᓐᑭᓂᐧᒪᐱᓴᐣ	winihiikinaapiskw	eyeglass
ᐧᐃᓂᖅᐃᖅᓲᐱᓴᐣ	atuushaapiskw	metal for traps
ᐊᑐᔭᐱᓴᐣ	utaapaanaaskupiywaapiskw	hard rock used for tools
ᐅᑦᐸᓲᓯᐧᒪᐧᔨᐱᓴᐣ		metal for toboggan runners

Activity 6. To work with the notions of sets and subsets as they are realized in the Cree language, look for objects whose names combine weight or shape with the above finals. Some of these concepts tend to be expressed at the beginning of the word (see also section 5 on geometry). When we combine both finals and initials we have Intersection in set theory.

3. Reduplication and Distributivity

Cree has reduplicated numerals that are used to express distributivity. paahpeyakw, naaneu, naanewaau...
The Cree language is very rich in expressing all kinds of distributive situations, that can be described using set theory graphs.

See **Appendix B**

Activity 7. Ask the children to draw the graphs to represent situations expressed by reduplicated numerals.

4. Division

Division is a difficult concept for all children, but it can be made accessible by relating it to the traditional concept of sharing. Traditional method of dividing game preserve the distinct anatomical identity of each share, it is not based on a 300gr of meat per person formula, but rather on which parts of the animal go to which person (for example the head of the goose for the hunter, the feet for the older woman, etc.) The words for dividing in two, three equal parts are a good introduction to arithmetical division.

Activity 8.
Give children things that they can break into two or three pieces, or pieces of paper or of clothing that they can cut, asking them to make the pieces equal. Sometimes things break or divide better a certain way, so that the resulting parts are not all the same. Let them experience the property of objects that can be divided.

Activity 9.
Stories can be used to introduce the children to the concept of division using the traditional concept of sharing. The stories in Appendix C were created during the workshop.
Tell the children similar stories, using puppets or making them act out the story. Question them during or after the story.
See **appendix C**- stories by teachers (Smally and Pauline for Southern, Frances for Northern)

Activity 10. For more advanced levels, also using English or French, look up the Cree words in the on-line Cree dictionary (www.eastcree.org) by searching for "divide" (French: "diviser").

5. Geometry

Shape categories are the precursor of Geometry. The Cree language expresses lots of shape categories, which can be used to introduce the children to geometry.
One difference to keep in mind is that shape categories have vague boundaries, because they are based on a prototype, while geometrical concepts have precise boundaries. For example, the geometrical notions of line, plane and solid are defined by zero values of a variable, while a categorial approach uses the spatial dimensions of length, width and thickness divided into small and large values with vague boundaries between them. Nevertheless, since shape categories are very richly expressed in Cree, children can get a firm grounding in understanding them in their traditional culture before moving on to more abstract notions.

Shape and context - The words below show how the meaning of circle appears related to other contextual properties. (Pay attention to the initial, medial, and final part of the word)

·ᐁᐧᐃᐊᐳᐦᒋᐤ (cutting a circle using a tool eg. saw, file)

1ₓ ᒥᔨᑎᐣ (wood-like) ex. plywood, gibrock (drywall)

2ₓ ᐊᐱᓂ (stone-like)

3ₓ ᐱᐧᐸᐱᐠᐣ (metal-like)

·ᐁᐧᐃᐊᔑᒪ (cutting a circle using a tool eg. scissors, knife, crooked knife)

1. ᒪᐱᓄᐦᐁᑎᐧᐃᓴᐟ (paper-like)
2. ᐱᔩᐅᐸᐟ (material/sheet like)
3. ᒧᐱᐅᐸᐟ

·ᐁᐧᐃᐊᔑᐦᐣᐦᐦᐊᒪ (filing something to make a circle using a tool eg. file)

·ᐁᐧᐃᐊᐅᐣᐦᐣᐦᐊᒪ (making a circle in the snow using a shovel)

·ᐁᐧᐃᐊᐅᐣᐦᐣᓇᒪ (making a circle in the snow using your

hand)

·ᐊᐧᐃ·ᐃᔪᐠᐅ"ᑭᓘᒻ (s/he makes a circle in the sand)

·ᐊᐧᐃ·ᐃᔪᐠᓯᑭᓘᒻ (s/he makes a circle in the mud)

·ᐊᐧᐃ·ᐃᔪᐟᖏᑭᓘᒻ (s/he makes a circle in the ground)

Activity 11.

1. Bring items to the classroom;

- a piece of wood (ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᖏᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪ>ᑦᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᑯᑌᓐ)
- clay (ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᐟᓯᑭᓂᓐ)
- material of some sort (ᑭᒃ ·ᐊᐧᐃ·ᐃᔪ·ᑲᑌᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᖏᓐ,)
- paper (ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᖏᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᑭᓂᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᕐᓘ"∇ᓐ)
- string (ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᐟᐱ"ᒣᓂᓐ, ᑭᒃ ·ᐊᐧᐃ·ᐃᔪᐟᐯᒃᓴᑦᓐ)

Explain that these all come from the word "circle"

Do some of these things:

- making a circle in the clay.
- cutting a circle from the paper
- making circles using the string

Activity 12. Read to the children stories like the one in appendix D. Have them do crafts, modeling, carving or drawings of elements of the story.

More activities that could you do with the (Angle) story

1) search words in the lexicon
2) make a mural (angles)
3) cut out pictures of "angle" objects
4) make a list of words that start with ᐋᒥ
5) Show and Tell --have students bring objects that are angled or twisted shaped
6) gather firewood that is twisted shaped
7) make a pretend lake (or go on an actual pond or small lake) and walk on it diagonally. Explain what direction you are walking (ᐋᒥᑲᒪᓵᑯᑌᐤ - ᐋᒥᑲᒪᓵᑯᐱᔨ)

8) Visit a teepee that has a fireplace or a wood stove and show students how you can put firewood at an angle.
9) students can develop songs about angles

Activity 13. Imagine with the children a story like the one in Activity 12, but this time using another shape concept. Create the story with the children, using their imagination.

Activity 14. For more advanced levels, also using English or French, look up the Cree shape words in the on-line Cree dictionary (www.eastcree.org) by searching for "angle, circle, round, point, long, flat ". Study the Cree words and see which situations they describe, which part of the word expresses the geometry concept and how other parts of the word express texture and material. Notice how Cree words tend to be precise and concrete.

Appendix A Numeral words

The words in the list below are examples of a very productive way to create compound words in Cree that measure quantities. These words are particles, they do not take plural inflection or possessive marking,
For example the particle ᓂᐧᐁᒥᐦᑳᓐ newemihkwaan 'four tablespoons of something' is different from the words used to just count tablespoons ᓂᐤ ᓂᐧᐁᒥᐦᑳᓱ neu emihkwaanich 'four tablespoons'. These particles can be used to measure volume, weight, quantity, distance and time.

Southern

ᓂᐤ + ᐁᒥᐦᑳᓐ = ᓂᐧᐁᒥᐦᑳᓐ	neu+emihkwaan=newemihkwaan	*four tablespoons*
ᓂᐤ + ᓂᐧᐁᒥᐦᑳᓱᓴ = ᓂᐧᐁᒥᐦᑳᓱᓴ	neu+emihkwaanish=newemihkwaanish	*four teaspoons*
ᓂᐤ + ᐧᐊᐢᐱᐟᐣ = ᓂᐧᐊᐢᐱᐟᐣ	neu+waapisc=newaapisch	*four stones*
ᓂᐤ + ᐧᐊᐢᐱᐟᐤ = ᓂᐧᐊᐢᐱᐟᐤ	neu+waapiskw=newaapiskw	*four pieces of metal*
ᓂᐤ + ᐧᐊᐢᐦᑎᐦᐤ = ᓂᐧᐊᐢᐦᑎᐤ	neu+aahtihkw=newaahtikw	*four sticks, pieces of lumber*
ᓂᐤ + ᐧᐁᐟ = ᓂᐧᐁᐟ	neu+wech=newech	*four sheets of paper*
ᓂᐤ + ᐧᐁᑲᓐ = ᓂᐧᐁᑲᓐᐦ	neu+wech=newekanh	*four blankets*
ᓂᐤ + ᐧᐁᒋᔨ = ᓂᐧᐁᒋᔨᐧᐃᐣ	neu+wech=newechisuwich	*four moosehides, pelts, clothes(pants)*

ᓄᐤ + ·∇ᒋᐦᑎᓵ = ᓄ·∇ᒋᐦᑎᓵᐦ	neu+wech=newechihtinh	*four layers of clothing*
ᓄᐤ + ·Δ·∇ᐩᐣ (·Δ₋ᓄ·∇ᐩᐣ)I =ᓄ·Δ·∇ᐩᐣ (ᓄ·Δ₋ᓄ·∇ᐩᐣ)I	neu + wiiweyaau (wiinuweyaau)I =newiiweyaau (newiinuweyaau)I	*four pairs of shoes*
ᓄᐤ + ·ᐊᐯᐠ = ᓄ·ᐊᐯᐠ ᓄᐤ + ·ᐊᐯᑲᓵ = ᓄ·ᐊᐯᑲᓵᐦ	neu+aapech=newaapech	*four strings (snares, nightlines)*
ᓄᐤ + ᐅᐦᑎᐠ = ᓄᐅᐦᑎᐠ	neu+ uhtich=neuhtich	*four firewood*
ᓄᐤ + ᑕᐠ = ᓄᐅᑕᐠ	neu+ tach=neutach	*four canoes*
ᓄᐤ + ᓯᓂᑲᓵ = ᓄᐅᓯᓂᑲᓵ	neu+sinikan=neusinikan	*four armfuls*
ᓄᐤ + ᔨᒋᓵ = ᓄᐅᔨᒋᓵ ᐅᒋᓵ (ᓄᐅᒋᓵ)	neu + naachuutaan = neunaachuutaan	*carrying four packloads*
ᓄᐤ + ᓰᔨᒋᓵ = ᓄᐅᓰᔨᒋᓵ (ᓄᐅᒋᓵ)	neu + naachuutaan = neunaachuutaan	*four packloads*
ᓄᐤ + ·ᐃᐩᑲᓵ = ᓄᐅᐩᑲᓵ	neu + wiyaakan = neuyaakan	*four platefuls*
ᓄᐤ + ᑎᐸᐦᐃᑲᓵ = ᓄᐅᑎᐦᐸᐦᐃᑲᓵ	neu + tipahiikan = neutipahiikan	*four miles, gallons*
ᓄᐤ + ᑎᐸᐦᐃᑲᓵ = ᓄᐅᑎᐦᐸᐦᐃᑲᓵ (I)	neu + tipahiikan = neutipahiikan	*four hours*
ᓄᐤ + ᑭᓂ·ᑲᓂᑌᐤ = ᓄᐅᑭᓂ·ᑲᓂᑌᐤ (C) & (I)	neu + tipahiikan = neutipahiikan	*four hours*
ᓄᐤ + ᒥᔨᑦ = ᓄᐅᒥᔨᑦ	neu + misit = neumisit	*four feet*
ᓄᐤ + ᒥᑎᐦᑎᓵ = ᓄᐅᒥᑎᐦᑎᓵ	neu + mihchichin = neumichihchin	*four inches(thumbs)*
ᓄᐤ + ᑎᐸᓴᐦᐃᐦᐃᑲᓵ = ᓄᐅᑎᐸᓴᐦᐃᐦᐃᑲᓵ	neu + tipaaskuhiikan = neutipaaskuhiikan	*four rulers, yardsticks*
ᓄᐤ + ᑎᐸᓴᐦᐃᓂᑲᓵ = ᓄᐅᑎᐸᓴᐦᐃᓂᑲᓵ	neu + tipaaskunikan = neutipaaskunikan	*four yards*
ᓄᐤ + ᑎᐸᐸᑎᑲᓵ = ᓄᐅᑎᐸᐸᑎᑲᓵ	neu + tipaapaachikan = neutipaapaachikan	*four measuring tape lengths*
ᓄᐤ + ᒥᓂᐱᑌᐤ = ᓄᐅᒥᓂᐱᑌᐤ	neu + minipitaau = neuminipitaau	*four bundles*
ᓄᐤ + ᔪᑲᑎᔪᐠ = ᓄᐅᔪᑲᑎᔪᐠ	neu + skatiyech = neuskatiyech	*four packages*
ᓄᐤ + ·ᐊᐧ·ᐃᔪᐦᑕᑲᓵ = ᓄᐅ·ᐊᐧ·ᐃᔪᐦᑕᑲᓵ	neu + waawiyehtaakan = neuwaawiyehtaakan	*four barrels*
ᓄᐤ + ᐊᔪᑎᐣ = ᓄ·∇ᔪᑎᐣ = ᓄᐅᔪᑎᐣ	neu + aschihkw = newaschihkw = neuschikw	*four pails*
ᓄᐤ + ·ᑲᐱᐩᑲᓵ =	neu + kwaapikaakan =	*four 20 lb. lard pails*

ᓄᐅ·ᐠᐱᐠᑲᓴ	neukwaapikaakan	*(M)*
ᓄᐤ + ·ᐠᐱ"ᐃᑲᓴ = ᓄᐅ·ᐠᐱ"ᐃᑲᓴ	neu + kwaapihiikan = neukwaapahiikan	*four scoopfuls*
ᓄᐤ + ᐱ"ᐧᑲᓴ = ᓄᐅᐱ"ᐧᑲᓴ	neu + pihkaan = neupihkaan	*four strand braid*
ᓄᐤ + ᐧ·ᐊᑦ = ᓄᐅᐧ·ᐊᑦ	neu + miiwat = neumiiwat	*four boxes*
ᓄᐤ + ᓂᕀᑭ = ᓄᐅᓂᕀᑭ	neu + nisch = neunisch	*four armlengths*
ᓄᐤ +·ᐠᐱᓂᑲᓴ = ᓄᐅ·ᐠᐱᓂᑲᓴ	neukwaapinikan	*four handfuls*
ᓄᐤ + ᒥᓂ"·ᑲᑲᓴ = ᓄᐅᒥᓂ"·ᑲᑲᓴ	neu + minihkwaakan = neuminihkwaakan	*four cupfuls*
ᓄᐤ + ᑎᐸᐧᐯᕀᑭᑲᓴ = ᓄᐅᑎᐸᐧᐯᕀᑭᑲᓴ	neu + tipaapeskuchikan = neutipaapeskuchikan	*four pounds*
ᓄᐤ + ·ᐃᐣ = ᓄᐅ·ᐃᐣ	neu + wich = newich	*four ways*
ᓄᐤ + ᒥᑎ"ᐧᑲᓴ = ᓄᐅᒥ"ᑎ"ᐧᑲᓴ	neu + mihtihkaan = neumihtihkaan	*four cords of wood*
ᓄᐤ + ᒥᓂᔨᐣ = ᓄᐅᒥᓂᔨᐣ	neu + minikush = neuminikush	*four minutes*
ᓄᐤ + ᒪᑭᔑᑲᓴ = ᓄᐅᒪᑭᔑᑲᓴ	neu + maachishikan = neumaachishikan	*four slices*
ᓄᐤ + ᐱ·ᕿᔑᑲᓴ = ᓄᐅᐱ·ᕿᔑᑲᓴ	neu + maachishikan = neumaachishikan	*four slices*
ᓄᐤ + ·ᐃ"·ᕿᐩᐣ+ ᓄᐅ·ᐃ"·ᕿᐩᐣ	neu + wiihkweyaau = newiihkweyaau	*four bags*
ᓄᐤ + ᒥᓂᑦ = ᓄᐅᒥᓂᑦ	neu + minich = neuminich	*four berries*
ᓄᐤ + ·ᐊᓂᑦ = ᓄᐅ·ᐊᓂᑦ	newaanich	*four islands*
ᓄᐤ + ᒥᓂᔨᐣ = ᓄᐅᒥᓂᔨᐣ	neu + miniskaau = neuminiskaau	*four dozen*
ᓄᐤ + "ᑎ = ᓄᐅ"ᑎ	neu + htii = neuhtii	*four dollar*
ᓄᐅ + ᓐᔨ = ᓄᐅᓐᔨ	neu + shtuu = neushtuu	*four beaver lodges*
ᓄᐤ + ᒥᓄ"ᐃᑐ·ᐃᑦ = ᓄᐅᒥᓄ"ᐃᑐ·ᐃᑦ	neu + minehiituwich = neuminehiituwich	*four groups*
ᓄᐤ + ᐃᔨ·ᕿᐅᑦ+ ᓄᐅᔨ·ᕿ·ᐃᑦ	neu + iskwewich = neuskwewic	*four women*
ᓄᐤ + ·ᐊᐯ·ᐃᑦ = ᓄᐅ·ᐊᐯ·ᐃᑦ	neu + aapewich = newaapewich	*four men (in the family)*
ᓄᐤ + ᐸᒥᑭᓯ·ᐃᑦ = ᓄᐅᐸᒥᑭᓯ·ᐃᑦ	neu + kamichisuwich = neukamichisuwich	*four tents full of people*
ᓄᐤ + ᒥᓄᔨᑭᓂᑦ = ᓄᐅᒥᓄᔨᑭᓂᑦ	neu + minekuchinich = neumenikuchinich	*four flocks*

Northern:

ᐊᓗᐤ	naau	
ᐊᓗ·ᐊᒥᐦ·ᑲᓄ	naawaamihkwaan	four tablespoons
ᐊᓗ·ᐊᒥᐦ·ᑲᓂᔅ	naawaamihkwaanish	four teaspoons
ᐊᓗ·ᐊᐱᕀᐣ	naawaapisch	four stones, pieces of metal
ᐊᓗ·ᐊᐦᑎᐦᐧ	naawaahtihkw	four sticks, pieces of lumber
ᐊᓗ·ᐊᒡ	naawaach	four sheet-like.....
ᐊᓗ·ᐊᒋᐢᒡ	naawaapaach	four strings
ᐊᐅᐦᑎᒡ	naauhtich	four firewood
ᐊᐅᑎᒡ	naautich	four canoes of...
ᐊᐅᑎᑲᐤᐦ	naautikaauh	four canoes
ᐊᐅᓯᓂᑭᓄ	naausinikan	four armfuls
ᐊᐅᐊᑎ·ᐃᒋᑭᓄ	naaunaachiutaakin	four packloads
ᐊᐅᔭᑭᓄ	naauyaakin	four platefuls four loaves of bread
ᐊᐅᑎᐱᐦᐄᑭᓄ	naautipihiikan	four miles
ᐊᐅᒥᓯᑦ	naaumisit	four feet
ᐊᐅᒥᑎᐦᒋᓄ	naaumichihchin	four inches
ᐊᐅᑎᐸᐣᑯᐦᐃᑭᓄ	naautipaaskuhiikin	four ruler, stick
ᐊᐅᑎᐸᐣᑯᓂᑭᓄ	naautipaaskunikin	four yards
ᐊᐅᑎᐸᐸᒋᑭᓄ	naautipaapaachikin	four measuring units (string-like)
ᐊᐅᒥᓂᐦᐱᑕᐤ	naauminihpitaau	four bundles
ᐊᐅᐣᑭᑎᑭᔭᒋᐦ	naauskitiyaachii	four packages
ᐊᐅᐣᑭᑎᑭᔭᐣ	naauskitiyaach	four packages
ᐊᐅᐧᐊᐧᐃᑭᐦᐃᑭᓄ	naauwaawiyaahtaakin	four barrels
ᐊᓗ·ᐊᐣᑎᐦᐧ	naawaaschihkw	four pails of...
ᐊᐅᐧᑲᐱᑲᐦᐃᓄ	naaukwaapikaawaakin	four water containers of ... (liquid)
ᐊᐅᐧᑲᐱᐦᐃᑭᓄ	naaukwaapihiikin	four scoops
ᐊᐅᐱᐦᐃᓄ	naaupihkaan	four strands
ᐊᓗ·ᐊᐱᐦᐃᓇᓄ	naawaapihchaan	four strands of ...
ᐊᐅᐅᐧᐃᑦ	naauuwit	four boxes of something
ᐊᐅᐧᐃᓂᔅᐣ	naauwinisch	four arm lengths
ᐊᐅᐧᑲᐱᓂᑭᓄ	naaukwaapinikin	four handfuls
ᐊᐅᒥᓂᐦᑲᐦᑭᓄ	naauminihkwaakin	four cupfuls
ᐊᐅᑎᐸᐸᓴᑎᑭᓄ	naautipaapaashkuchikan	four pounds
ᐊᐅᐧᐃᐣᐠ	naauwiyich	four ways
ᐊᐅᐧᐃᐣᑭᓄ	naauwiyikin	four ways
ᐊᐅᒥᐦᑎᐦᐃᓄ	naaumihtihkaan	four cords of wood
ᐊᐅᒥᓂᑯᔅ	naauminikush	four minutes
ᐊᐅᐃᒋᔑᑭᓄ	naaumaachishikin	four slices

ᓇᐅ·ᐃ"·ᑲᓴᐤ	naauwiihkwaayaau	four bags
ᓇᐅᒥᓂᔪ	naauminich	four berries
ᓇᐅᒥᓂᑭᓯᐅ·ᐃᔪ	naauminichisiuwich	four berries
ᓇᐅᒥᓂᑲᐤ"	naauminikaauh	four berries
ᓇ·ᐊᓂᑲᐤ"	naawaanikaauh	four islands
ᓇᐅᒥᓂᔦᑲᐤ	naauminiskaau	four bundles
ᓇᐅ"ᑎ	naauhtii	four dollars
ᓇᐅᒥᓇᓱᑐ·ᐃᔪ	naauminaayituwich	four groups
ᓇᐅᔦᑲᐅ·ᐃ·ᐃᔪ	naauskwaauwiwich	four women
ᓇ·ᐊᐸᐅ·ᐃᔪ	naawaapaauwich	four men
ᓇᐅᑭᒥᑭᓯ·ᐃᔪ	naaukimichisiwich	four shelters in a camp
ᓇᐅᒥᓇᑲᑎᓂᔪ ᓇᐅᒥᓂᑲᑎᓂᔪ	naauminaakuchinich naauminikuchinich	four flocks of birds
ᓇᐅᒥᓂ"ᐱᑦᐤ	naauminihpitaau	four bundles
ᓇᐅᓂᐱᑦᔦᔪᑲ"ᐃᑭᓇᔦᐤ	naauniipitaayaaskuhiikinaayaau	four food racks of food, meat
ᓇᐅᑊᒻᓇᔦᐤ	naauchiimaanaayaau	four cargo loads (anim) four boat loads
ᓇᐅᑊᒻᓇᓐ	naauchiimaan	four cargo loads (anim)
ᓇᐅᑊᒻᓇᔦᐤ"	naauchiimaanaayaauh	four cargo loads (inanim)
ᓇᐅᓴᑎᐤ	naaushtiu	four beaver lodges
ᓇᐅᓴᑎ·ᐊᔨ·ᐃᔪ	naaushtiwaasiwich	four beaver lodges
ᓇᐅᓴᑎ·ᐊᐩᐤ"	naaushtiwaayaauh	four beaver lodges
ᓇᐅ·ᐊᔪᑎᔪ	naauwaastich	four tree boughs
ᓇᐅᐅ"ᐃᐸ	naauuhiip	four fishnets
ᓇᐅᐱᔪᑭᓇ	naaupiskin	four mesh loops of a net
ᓇᐅᓴᑎ·ᑲᓴᐤ"	naaushtikwaayaauh	four rivers
ᓇᐅᑭᒪᐤ"	naaukimaauh	four lakes
ᓇᐅᐱᑦᐤ	naaupitaau	s/he grabs four
ᓇᐅᐅᐱᑦᐤ	naauupitaau	s/he catches four fish with net
ᓇᐅ·ᐃᓀᓯᐅᔪ	naauwikusiiuch	four perching
ᓇᐅ·ᐊ·ᐊᔪᒐᐤ	naauwaawaaschaau	four gun blasts
ᓇᐅ·ᐊᐸᑭᓇ"	naauwaapaakinh	four snares
ᓇᐅᐳᓂᑭᓇ	naaupuunikin	four woodfire loads
ᓇᐅ·ᐃᔪᑎᓯᓇ	naauwischisin	four pairs of footwear
ᓇᐅᑎᐱᔪ·ᑲᐤ	naautipiskwaau	four nights away from home
ᓇᐅᑎᐱᔪᑲᐤ"	naautipiskaauh	four nights
ᓇᐅᑎ·ᐃᓂᐱᑦᐤ"	naautiwishtaauh	four weeks
ᓇᐅᐊᓯᒪ"	naaupiisimh	four months
ᓇᐅᐅᐱᐳᓇ"	naauupipunh	four years/winters
ᓇᐅᐅᑦᐅᓯ·ᐃᔪ	naauutaausiiwich	there are four families
ᓇᐅᔪᑭᒧᔪ	naauskimuch	there are four sets of tracks
ᓇᐅ"ᓴᐅ·ᐃᔪ	naauhyaauwich	there are four flying

ᓇᐅᑯᒋᓂᖅ	naaukuchinich	there are four hanging
ᓇᐅᑎᒧᐅ·ᐃᖅ	naauchimaauwich	there are four swimming
ᓇᐅᐱᐯ·ᐃᖅ	naaupiyuwich	four moving on something
ᓇᐅᐦᑦ·ᐃᖅ	naauhtaawich	there are four walking
ᓇᐅᐅᐦᐧᒪᒧᖅ	naauuhkumich	there are four in a canoe
ᓇᐅᑲᐳ·ᐃ·ᐃᖅ	naaukaapuwiwich	there are four standing
ᓇᐅᑎᖫ·ᑲᒧ·ᐃᖅ	naauchihkwaamuwich	there are four sleeping
ᓇᐅᔑᓂᖅ	naaushinich	there are four lying down
ᓇᐅᑦᐸᓇᓴᐧ	naautaapaanaaskw	four truckloads
ᓇᐅᕈᒥᑎᔨ·ᐃᖅ	naaukimichisiwich	there are four shelters for the group of people
ᓇᐅᓴᓚ	naausaam	four pairs of snowshoes
ᓇᐅᓴᒪᓱᐣ	naausaamaayaau	material enough for four pairs of snowshoes
ᓇᐅᑎᓇᐤᐦ	naautinaauh	four mountains
ᓇ·ᐊᐦᑎᐧ	naawaahtikw	four stick-like objects
ᓇᐅᐱᐦᐃᑐ·ᐃᖅ	naaupihiituwich	four running
ᓇᐅᑲᑦ·ᐊᐩᐣ	naaukaataawaayaau	something that is four-legged i.e. table
ᓇᐅᐱ·ᐩᐱᓵᑯᐩᕈᓭ	naaupiywaapuskuyaakin	four bottles
ᓇᐅᐱᐦᑦ·ᐃᖅ	naaupihtaawich	there are four running
ᓇᐅᑭᔑᐦᐧᑲᐩᐣ	naauchiishihkwaayaau	it will take four days to do it
ᓇ·ᐊᐅᕈᓭᐦ	naawaaukinh	four eggs
ᓇᐅᑎᓴᑐᓇᓱᐣᐦ	naauchishtunaayaauh	eggs from four nests
ᓇᐅᐱᑎ·ᐃᓇᓱᐣ	naaupichiwinaayaau	four days of travelling in winter
ᓇᐅᐳᓱ·ᐃᖅ	naaupuyaawich	four people paddling the canoe
ᓇᐅᓯᔑᕈᓭ	naausinikin	four armloads of .....

Appendix B- Reduplication and Distributivity

DISTRIBUTIVE NUMERALS IN CREE (SOUTHERN)

(1) Regular and reduplicated numerals

ᐯᕆᐣ	ᐸᐦᐯᕆᐣ	peyakw 'one'	pâh-peyakw Redup-one 'one by one, each'
ᓂᔨ	ᓀᓂᔨ	nîshu 'two'	nâ-nîshu Redup -two 'two each'
ᓇᐤ	ᓀᓇᐤ	neu 'four'	nâ-neu Redup -four 'four each'
ᒥᑖᐦᑎ	ᐚᒥᑖᐦᑎ	mitâhtw 'ten'	mâ-mitâhtw Redup -ten 'ten each'

(2) ᓇᐤ ·ᐊᐱᒥᓂᐦᐃᐣ ᑊ ᒧ·ᐁᐅᐠ ᐊᓄᑊ ᐊ·ᐊᔑᐠₓ
neu wâpiminhchî muweuch anchî awâshich.
'The children ate four apples.'

(3) ᓀᓇᐤ ·ᐊᐱᒥᓄᐦᐃᐣ ᑊ ᒧ·ᐁᐅᐠ ᐊᓄᑊ ᐊ·ᐊᔑᐠₓ
nâneu wâpiminh chî muweuch anchî awâshich.
'The children ate four apples each.'

(4) Temporal numerals (regular and reduplicated)

ᐯᕆ·ᑲᐤ	ᐸᐦᐯᕆ·ᑲᐤ	peyakwâu one-times 'one time'	pâh-peyakwâu Redup- one-times 'one time each'
ᓂ·ᓱᐤ	ᓀᓂ·ᓱᐤ	nîsh-wâu two-times 'two times'	nâ-nîsh-âu Redup- two-times ' two times each'

(5) ᓇᐅ·ᐊᐧᐤ ᑊ ᐊᐳᒧᐠₓ neuwâu chî ayimuuch.
'They spoke four times.'

(6) **ᓀ**ᓇᐅ·ᐊᐧᐤ ᑊ ᐊᐳᒧᐠ ₓ **nâ**neuwâu chî ayimûch.
'They spoke four times each.'

(7) **ᐸᐦᐯᕆᐣ** ·ᐊᐱᒥᐦᐃᐣ ᑊ ᒧ·ᐁᐅᐠ ᐊᓄᑊ ᐊ·ᐊᔑᐠₓ
[NP(object) **pâh**-peyakw wâpimin-h] [S chî muweuch] [NP(subject) anchî awâsh-ich].
'The children ate one apple each.'

(8) ᐸᐣᐯᓴᐧ ᐊᐧᐊᔨᐠ ᐢ ᒧᐧᐁᐅᐠ ᐧᐊᐱᒥᓐᐧ
[NP(subject) **pâh-**peyakw awâsh-ich] [S chî muweuch] [NP(object)wâpimin-h].
'Each of the children ate an apple/apples.'

The Cree language can express with reduplicated numeral a large array of distributive situations. The interpretation of those sentence can be represented by graphs.

(9) Intransitive Verb (vai or vii) the numeral modifies the subject of the sentence:

a. ᓂᐤ ᐊᐧᐊᔨᐠ ᐢ ᑎᑭᓯᐠ
neu awâshich chî mîchisuch.
'Four children ate.'

b. ᓀᓂᐤ ᐊᐧᐊᔨᐠ ᐢ ᑎᑭᓯᐠ
nâneu awâshich chî mîchisuch.
'The children ate, in groups of four.'

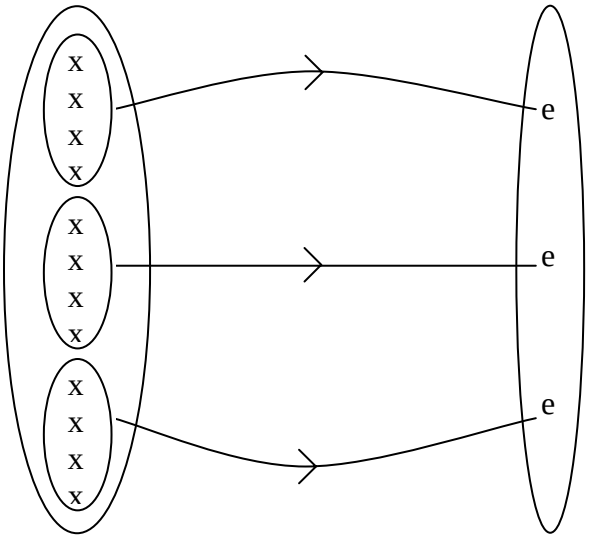
(10) Transitive Verb (vta or vti) : the numeral modifies the subject of the sentence

a. ᓂᐤ ᐊᐧᐊᔨᐠ ᐧᐊᐱᒥᓐᐧ ᐢ ᒧᐧᐁᐅᐠ
neu awâshich wâpiminh chî muweuch.
'Four children ate apples.'

b. ᓀᓂᐤ ᐊᐧᐊᔨᐠ ᐧᐊᐱᒥᓐᐧ ᐢ ᒧᐧᐁᐅᐠ
nâneu awâshich wâpiminh chî muweuch.
'The children four by four (or in groups of four) ate apples.'

(11) Schema A

Distributed share: (Subject) children (x)	Sorted key: (Object) apple-eating event (e)



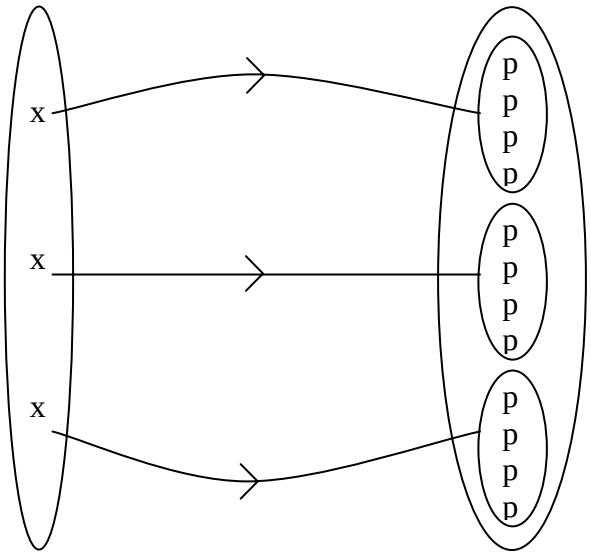
(12) Transitive Verb (vta or vti): The numeral modifies the object:

a. ᓚᐤ ·ᐊᐱᐱᒥᐦ ᑊ ᒧ·ᐁᐅᐣ ᐊᓐᑊ ᐊ·ᐊᔨᐣ
Neu wâpiminh chî muweuch anchî awâshich.
'The children ate four apples.'

b. **ᓀ**ᓚᐤ ·ᐊᐱᐱᒥᐦ ᑊ ᒧ·ᐁᐅᐣ ᐊᓐᑊ ᐊ·ᐊᔨᐣₓ
Nâneu wâpiminh chî muweuch anchî awâshich.
'The children ate four apples each.'

(13) Schema B

Distributed share: (Subject)		Sorting key: (Object)
children (x)	(eating)	apples (p)



Plurality constraint (also found in other languages in distributive contexts); the subject of the sentence must be plural.

Examples, during a party, the hostess asks her husband to give cookies on a tray:

(14) **ᓵ"**ᐯᓴᐧ ᐊ·ᐁᐦ ᖶ ᒥᓴᑦₓ
pâhpeyakw awen che miyat!

(15) ᓂᔓ ᐊᐃ"ᐧᑯᓀᔨ ᖶ ᒥᓴᑦ **ᓵ"**ᐯᓴᐧ ᐊ·ᐊᐣₓ
nishu âihkunâsha che miyat **pâh**peyakw awash!

Speaking about four different kinds of fish received as a gift: (here the sorting key is taken from the context, different kinds of fish, and the sentence does not need a plural subject or beneficiary object)

(16) ᐅᓇᓂᐤ ᓂᑲᒋᐦᑭᒻ **nâ**neu nichî mîkw.

Reduplicated numeral in verbs. Subject must be plural.

(17) ᒋᐦ ᓂᐅᐳᐦᑲᒪᒡᐠ Chî neuhkamuch.
'Four of them were doing it.'

(18) ᒋᐦ ᐅᓇᓂᐅᐳᐦᑲᒪᒡᐠ Chî **nâ**neuhkamuch.
'They were doing it in groups of four.'

(19) ᒋᐦ ᓂᐅᐳᐦᐃᐅᐳᐠ Chî neuhteuch.
'Four of them were walking.'

(20) ᒋᐦ ᐅᓇᓂᐅᐳᐦᐃᐅᐳᐠ Chî **nâ**neuhteuch.
'They were walking in groups of four.'

As particles or as verb initial morphemes, reduplicated numerals are used in Cree to create distributivity operators.

References:

Ahenakew, Freda. & Wolfart, H.C. Productive reduplication in Plains Cree. (1983) In *Actes du quatorzième congrès des Algonquinistes*, William Cowan (ed.), pp.369-377. Ottawa: Carleton University.

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Junker, Marie-Odile (2007) La Réduplication en cri de l'Est : Quantification et Distributivité. *Faits de langue* Nº 29. In press.

DISTRIBUTIVE NUMERALS IN CREE (NORTHERN)

(1) Regular and reduplicated numerals

ᐸᐧᐣᐨ	ᐸᐦᐸᐧᐣᐨ	paahpaayikw 'one'	paah-paayikw Redup-one 'one by one, each'
ᓂᔑ	ᓀᓂᔑ	nîshu 'two'	nâ-nîshu Redup -two 'two each'
ᓀᐤ	ᓀᓀᐤ	nâu 'four'	nâ-nâu Redup -four 'four each'
ᒥᑖᐦᑐ	ᒧᒥᑖᐦᑐ	mitâhtu 'ten'	mâ-mitâhtu Redup -ten 'ten each'

(2) **Nâu** uskitimuih chîh mîchiwich anchî awâshishich.
'The children ate four apples.'

(3) **Nâ**nâu uskutimuih chî mîchiwich anchî awâshshiich.
'The children ate four apples each.'

(4) Temporal numerals (regular and reduplicated)

ᐸᐧᐣ·ᐦᐤ	ᐸᐦᐸᐧᐣ·ᐦᐤ	pâyikwâu one-times 'one time'	pâh-pâyikwâu Redup- one-times 'one time each'
ᓂ·ᓴᐤ	ᓀᓂ·ᓴᐤ	nîsh-wâu two-times 'two times'	nâ-nîsh-wâu Redup- two-times ' two times each'

(5)

(6) **ᓀ·ᐊᐤ** ᑊᐦ ᐊᐳᒧ·ᐃᐠ ˣ
nâwâu chîh ayimuwich.
'They spoke four times.'

(7) **ᓀᓀ·ᐊᐤ** ᑊᐦ ᐊᐳᒧ·ᐃᐠ ˣ
nânâwâu chîh ayimuwich.
'They spoke four times each.'

(8) **ᐸᐦᐸᐧᐣᐨ** ᐅᔭᑭᑎᒧᐃᐦ ᑊᐦ ᒋᑎ·ᐃᐠ ᐊᓂᑊ ᐊ·ᐊᔑᔑᐠˣ
[$_{NP(object)}$ **pâh**-pâyikw uskitimui-h] [$_{S}$ chîh mîchiwich] [$_{NP(subject)}$ anchî awâshish-ich].
'The children ate one apple each.'

The Cree language can express with reduplicated numeral a large array of distributive situations. The interpretation of these sentences can be represented by graphs.

(9) Intransitive Verb (vai or vii) the numeral modifies the subject of the sentence:

a. ᐅᐤ ᐊᐧᐋᔑᔑᓄ ᑭᐟᐟ ᑦᑎᓯᐧᐃᓄᓵ

nâu awâshishich chîh mîchisuwich.

'Four children ate.'

b. ᑭᐟᐟ ᐅᐤᐅᐧᐃᓄ ᐊᐧᐋᔑᔑᓄ ᑲ ᑦᑎᓯᐧᓄᓵ

chîh **nâ**nâwich awashishich kâ mîchisuch.

'The children ate, in groups of four.'

(10) Transitive Verb (vta or vti) : the numeral modifies the subject of the sentence

a. **ᐅᐤ** ᐊᐧᐋᔑᔑᓄ ᑭᐟᐟ ᒧᐧᐋᐃᓄ ᐅᕀᑭᑎᒧᐃᐟᓵ

nâu awâshishich chîh muwâwich uskitimuih.

'Four children ate apples.'

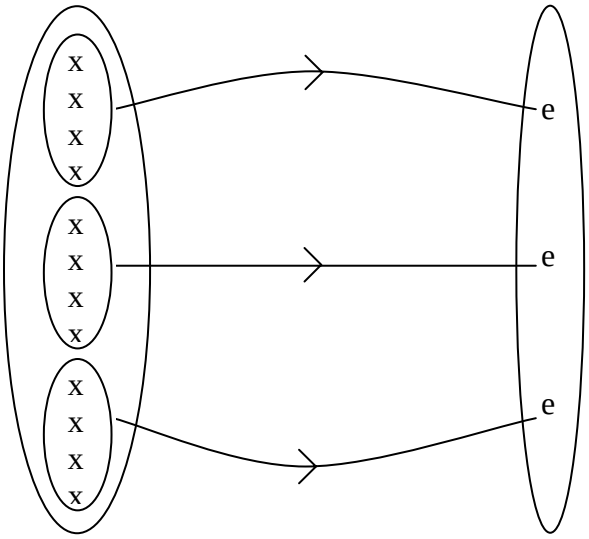
b. ᑭᐟᐟ ᐅᐤᐅᐧᐃᓄ ᐊᐧᐋᔑᓄ ᑲ ᒧᐧᐋᐃᓄ ᐅᕀᑭᑎᒧᐃᐟᓵ

chîh **nâ**nâuwich awâshishich kâ muwâch uskitimuih.

'The children four by four (or in groups of four) ate apples.'

(11) Schema A

Distributed share:	Sorted key:
(Subject)	(Object)
children (x)	apple-eating event (e)



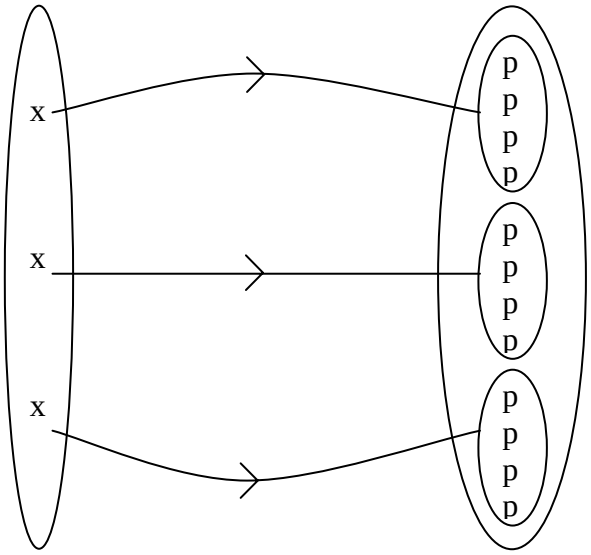
(12) Transitive Verb (vta or vti): The numeral modifies the object:

a. ᐃᓂᐤ ᐅᔨᕈᑎᒧᐃᐤ ᑭᐤ ᒋᑦᐧᐃᔨ ᐊᓂᑭ ᐊᐧᐊᔭᑦᔨₓ
nâu uskitimuih chîh mîchiwich anichî awâshishich.
'The children ate four apples.'

b. **ᐋ**ᐃᓂᐤ ᐅᔨᕈᑎᒧᐃᐤ ᑭᐤ ᒋᑦᐧᐃᔨ ᐊᓂᑭ ᐊᐧᐊᔭᑦᔨₓ
nânâu uskitimuih chîh mîchiwich anichî awâshishich.
'The children ate four apples each.'

(13) Schema B

Distributed share: (Subject) children (x) (eating) Sorting key: (Object) apples (p)



Plurality constraint (also found in other languages in distributive contexts); the subject of the sentence must be plural.

Examples, during a party, the hostess asks her husband to give cookies on a tray:

(14) **ᐸᐣ**ᐦᑫᔭᐣ ᐊᐃᐧᔨᐃᓐᐦᐤ ᐃ ᒥᔭᐧᑕᐤ ᐊᐧᐊᓂᑭₓ
pâhpâyikw âihkunâsh-h châ miyitwâu awânichî.

(15) **ᐸᐣ**ᐦᑫᔭᐣ ᐊᐧᐊᔨᔨᐦ ᐃᓄᓐᓴ ᐊᐃᐧᔨᐃᓐᐦᐤ ᐃ ᒥᔭᐧᑕᐤₓ
pâhpâyikw awâshishich nânîshu âihkunâsh-h châ miyitwâu.

Speaking about four different kinds of fish received as a gift: (here the sorting key is taken from the context, different kinds of fish, and the sentence does not need a plural subject or beneficiary object)

(16) **ᐋ**ᐃᓂᐤ ᓂᑭᐧᐃ ᒥᔭᐣₓ **nâ**nâu nichî miyikw.

Reduplicated numeral in verbs. Subject must be plural.

(17) ᒋᐟ ᐅᐅᑭᓯᒡᒃ chîh nâuuhkimuch.
'Four of them were doing it.'

(18) ᒋᐟ ᐄᐅᐅᑭᓯᒡᒃ chîh nânâuuhkimuch.
'They were doing it in groups of four.'

(19) ᒋ ᐅᐅᑎᒪᒃ chîh nâuhtâwich.
'Four of them were walking.'

(20) ᒋ ᐄᐅᐅᑎᒪᒃ chîh nânâuhtâwich.
'They were walking in groups of four.'

As particles or as verb initial morphemes, reduplicated numerals are used in Cree to create distributivity operators.

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Appendix C: Dividing and sharing stories

Smally's Story:

·∇ᓂᑲᑫ ᐊᓂᑌᐦ ᑭ ᐃᐦᑕᐤ ᐅᐯᐤ ᑭᐅᓂᓯᑭᓂ ᑭ ᐃᓯᓂᐦᑲᓯᓄ ᐅᓂᑫ ∇ ᑭ ᒪᐦᑌᐅᑦ ᐅ ᐅᐯᐤᓰ ᓀᐅᑕᐣᑫ ᓀᒪ ᐅᐦᑭ ᓂᑐ·∇ᔨᑕᒪ ᖵ ᑭ ᒻᔪᔨᒪᐦᐅᓀᐃᑦᓰ ∇ ᑭᔪᔨᑕᑲ ∇ ᒻᔪᔨᒪᓯᑦ ᐊ·∇ᔨ ∇ժᐦ ᑲ ᑭ ᓂᐸᐦᐊᑦ ᐊ·∇ᔨ ᐅᒥᑌ·ᐃᓂᑫ ᐅᐦᑭᓰ ᐅᓚᐣᓄᐦ ᒪᑲ ᑭ ᓂᐸᐦᐁᐤ ᐊ·∇ᔨᐦᓰ ᓂᑦᔭᐣ ᐃᐤ ᑭ ᓂᐸᐦᐁᐤ ᐊ·∇ᔨᐦᓰ ᓂᑦᔭᐣ ᐃᔭ·ϥᐤ ᐃᐯᐤᐦᓰ ᑭ ᐃᐦᑕᔨᐦ ·ᐃᑭᑦᔨᐦ ᐃᓂᑫ ∇ ᑭ ժᐃᔭժᐱᒪᑎᓂᔪᓴᑫᓰ ᑭ ᑭᔪᔨᑦᒪժ ᒪᐤ ᑭᓂᔨᐦ ·ᐃᑭᑦᔨᔨ ∇ ᑭ ᓂᐸᐦᐊᑦ ᐊ·∇ᔨ ᐊᑕ ∇ᑲᑫ ᐅᐦᐃ·ᐃᔨᑦᓰ ᐊᑕ ᒪᐤ ᑭ ᐊᑦᒥᐦᐃժᔨ ᐊᓂᔨᐦ ·ᐃᑭᑦᔨᔨ ∇ ᑭᔪᑕᐦᐊᑦᒪժᑦ ∇ᑲᑫ ᐊᓂᔨᐦᓰ ᐊᐤᐦᐃᑦᓰ ᐊᑕ ᒪᐤ ᒍᔭ ∇ ᑭ ᐊᑦᒥᐦᐃժᑦ ᐊᓂᔨᐦ ᓀᒧᐃᐤ ᐅᐦᐃᑫᓰ ᐊᐤ ᑭᐅᓂᑦᔨᐦ ᐊᓂᔨᐦ ᑭᔪᑕᐦᑲᑫᓰ ᑭ ᐃᐦᑕᐦᐃᑫᓰ ᑭ ᐃᐦᑕᐦᐃᑫ ᒪᐤ ᐊᐤ, ᒧᐦժᒪᐤ ∇ ᐊᐸᐦᑭᑦᓀ, ∇ժᑦᐦ ᓂᑐᐣ ᐃᔪᐦᑲᐤ ᖵ ᐃᐦᑕᐦᒪᓰ ᓀᒧᐃᐤ ᒪᐤ ᐅᐦᐃᓯᐱᐦᑕᒪ ᑭᐅᑐᑦᔨᑕᐤ ᐊᓂᔨᐦ ᐃᐦᑕᐦᐃᐦᐃᑦᓰ ᐃᑐᐦᑎᐦ ᒪᐤ ᒥᔪᑭᑕᐦ ᑭᐅᑐᑦᔨᑕᐤ ᐊᓂᔨᐦ ᐊᐦᑎᐦᐃᐦᑲᓂᐦ ∇ ᐊᑕ ᐦᖵᒥᑕᐦ ᐊᓂᔨᐦ ᐊᐦᑎᐦᐃᐱᐦᐃᐦ ∇ժᐦ ∇ᑕ ᐦᐦᖵᐦᒧᒧᓴᐦ ᐊᓂᔨᐦ ᐅᐱᐦᐃᐦ ᐊᓂᑌᐦ ∇ ᐃᐦᑕᑦ ᖵ ᐦ ᐊᑕ ᕀᐦᕀᐦᐅᑌᓴᐦᐦᐤ ᐅᓂᑭᓂժᐦᓰ ∇ժᑦᐦ ᒪᐤ ᐦ ᓀᓀᓄᑎᓂᑦ ᐊᓐ ᑭᐅᓂᑦᔨᑕᐤᓰ ∇ ᑎᒧժᑌᐦᐣ ᐱᔪᐅᑦᔭᑦ ᖵᒥᑎᒪᓐᓰ

Pauline's Story **·ᐊ>ᓂ ᑎ<ᒋᒧ·Δᵊ**

·∇ᓀᑲᑦ ᐊᓂᑌ" ∇ ᑭᐣ ᑭᔭᑕᒻᒪᑎᔨᓂᔭᑦ ᓄᖏᑦ>ᓂ ᑭᐣ ᓄᐅ·Δᔪ" ᐅ·ᐊ>"ᓚᔨᒪ"ₓ ∇ժ" ᐅ ᓇᒧΔ ᐅ"ᑭ ᐊᑦᐣ ᕿ·ᑲᔪ ᕿ ᑭᐣ ᒥᑦᐣ ∇ ᑭᖏᐊᓭᒥ"∇ᐅᑭᔨᔨᑲᑦₓ ᓇᓂᑲ ᒪᑲ ∇ ᑭᐣ ᒪᒥᑐᓄᓭ"ᑕᑲ ᑲ ∧<ᔪ"ᑌᔭₓ ∇ժ" ᐊᓂᔪ ∇ ∧<ᔪ"ᑌᔭ ᑲ ᒥᔦᑲᵐᑲ ·ᐊᐣ" ᑲ ᐋ"ᑕ"ᐊ"ᔭ ᐅᒪᔦժ"ᔨᐅ·ᐊᑕ"ᖏₓ ᓄᑭᓀᑲ·ᐊᔭ ᒪ"ᕕᓇ ᓂᑦᐱᐱᓂᑎժᔭ, ᕿժ"ᑎᑕᔭ ᓂᓇ ᐊᓂᔪ" ᐅ·ᐊᐅᒪ"ₓ ᑲ ᑭ·∇<"ᑕᔭ ᓇᓀᑌ ∇ ᔦᒋᔭᑦ ∇ժ" ᐅᔪ" ᐅ·ᐊᒪ" ∇ ᐊᒋᔦᑦ ·ᒣᖏᑲ ᓂᓇᓇᔦ Δ"ᑎ"ᑎᓂᔪₓ ∇ժᑦ" ᒪᑲ ᐅᑦ ᒥᑦᐣᑦᐅᑦᑕᖏᑲ ᑕᓂᑌ" ᕕ ᐃᔨ ᒪᑎᓂᒧ·ᐊᔭ ᐊᓂᔪ" ᐅᑕ·ᐊᔨᒪ"ₓ

Frances's Story **ᑲ ᐋᒥᑲᒪᒉᖏ ᑎ<ᒋᒧ·Δᵊ**

ᓴᑭ"ᐃᓂᖏᑲ ᓂᑭ" ·ᐃᒋᓀᵊₓ ᑲ <ᒋᑭ ∧ᒥ∧ᒋᒉᖏᑲ ᓀᓂᑲ ᐊᖏ" ᑭ" ᐋᒥᑲᒪᓴժ∧ᒋᒉᖏᑲₓ ᓀᓂᑲ ᐊᖏ" ᑭ" ᐋ·Δ"ᖏ ᑲ <ᒋᑭ ∧ᒥ∧ᒋᒉᖏᑲₓ ᑲ ᐊᑎ ·ᐊᓴᑭᒪᖏ ᐃᒉᵈ ᑲ ·ᐊ∧"ᑎᒪᖏ ᓀᓂᑲ ᐊᖏ" ᑭ" ᐋᒥᑲᒪᒉᖏᑲ ᑭᓴᒥᓀᵊ" ᓀᓂᑲ ᐊᖏ" ᑭ" ᐋᒥᑲᒪᒉᓴᑎᒥ·ᐊᖏᒥ∧ᓀₓ

ᑲ ᐅᑎ"ᑎᒪᖏ ᒥᑐᑭᔪ, ᐞ·ᑲᒥ"ᐃ ᐊ∧ᓚᐃ" ᓀᓂᑲ ᐊᖏ" ᐋᒥᑲᒪᒉᓴᑭᒧᑲ"ₓ ᐊժᑎ" ᑲ ·ᐃᒋժ∧ᓀ ᑲᐋᒥᑲᑎᑕᔭₓ ᔪᔭᖏᔪᑲ ᐊ·ᐊᒥᑦ ᐅᑦ ᒥᓂᒧᑲ ᓀᓂᑲ ᐊᖏ" ᐋᒥᑲᒪᒉᓴժᔪᑲₓ ᓀᓂᑲ ᐊᖏ" ᐋᒥ"ᑎᒋᔪᑲ, ᐊᐞ ᒥᔦ∧ᔭᔨᑲ ᐊ ·ᐃ" ᑕᓀᔪ"·ᐊᔪᒥᐅ·ᐃᑲₓ ᑕᒥᑎ" ᑭ" ·ᐃ" ·ᐃᒋᓀᒥ·ᐃᒋᑎₓ

ᒥᑎ·ᐊᑲ ᑲ ᒥᔪ·ᐊ"ᑎᑲᑲ" ᒥᒥ"ᑎᒥᓀᵊ"ₓ ᑲ ᐋ"ᑎᑭᑕᖏᑲ ᔪᔭᐸ ᐅ"ᐃ ᒥᒥ"ᑎᒥᓀᵊ"ₓ ᐊ·ᐊᵈ ᐅ ᑭᓴ∧ᓴᑭᓴ·ᐊᵈ ᑲ ᐋᒥᑲ>·Δᑦₓ ᐅ"ᐃ ᒥᒥ"ᑎᒥᓀᵊ" ∧ᓂᑲ ᐊᖏ" ᑭᓇ"ᑎᑲᑲ"ₓ ᐃᔭ·ᐊ ᐸᒥᑲᒪᓴᑕᔪᓂᑕᖏᑲ ᐅᓂᒥᑲ" ᑭᓴ∧ᓴᑭᓴ·ᐊᵈₓ

Δᓂժᑎᵏ ᑲ ᐅ·ᐊᔭᔪᒥᓄᖏᑲ, ᑲ ᐋᒥᑲᒪᔪᒥᓄᖏᑲₓ ᒥ·ᐊ>ᓴᒥᓀᵊ" ᐊᖏ" ᐋᒥᑲᒪᓴᓂᔪᓂᑕᑲ" ᖘᔾᐅ ᐅ"ᐃ ᒥᒥ"ᑎᒥᓀᵊ"ₓ ᐊ·ᐊᵈ ᐅ ᑭᓴ∧ᓴᑭᓴ·ᐊᵈ ᑲ ᐋᒥᑲ>·Δᑦₓ ᐅ"ᐃ ᒥᒥ"ᑎᒥᓀᵊ" ∧ᓂᑲ ᐊᖏ" ᑭᓇᑲᑎᑲᑲ"ₓ ᐃᔭ·ᐊ ᕿᒥᑲᒪᒉᓴᑕᔪᓂᑕᖏᑲ ᐅᑕ" ·ᐊᓴᑲ ᑦᑭ·ᐊ"∧"ᑲ, ᒥᑎ∧"·ᑲᔪᒥᓀᵊ" ᓀᓂᑲ ᐊᖏ" ᐋᒥᑲᒪᒉᖏᔪᑲ"ₓ ᖘᔾᐅ" ᐊᵈ ᑭᓂᔭ"ᖘᵈ ᐊᑎ ᐋᒥᑲᒪᒉᔪᑦₓ ᖘᔾᐅ" ᐊᵈ ∧ᒥᑭᓂ"ᖘᓀᓇ"ᑎժ /∧ᒥᑎ"ᑕ"ᐃᖘᵈ ᓀᓂᑲ ᐊᖏ" ᐊᑎ ᐋᒥᑲᒪᒉᓴժᔪᑦₓ ᐃᒉ∧ᑲ ᒪᵊ ᓄ·ᐃᑲ ᒥᑦᐣ ᒥᔦ·ᑲᔪᓀᵊ ᐊᑦ ᓀᓂᑲ ᐊᖏ ᑭᐣ ᐋᒥ"·ᑲᔨᒥᓀᵊₓ

Appendix D: Geometry

Frances's Story **ᒥᐧᓂᓄ ᑎᕐᒧᒍᐧᐃᓄ**

ᕐᓂᐧᑲᐤ ᐊᐩ ᒥᐧᓂᓄᐧᐃᓚᓵ ᓄᒥ ᓄᐩᑭ ᐊᔪᒥᐧᓂᐧᐃᓄᓴ ᑦᕐ ᐅᐩᑭ ᑭᔭᑭᐩᐅ ᐊᓄ ᑲᐩ ᒪᑎᓄᐧᐊᑦᓵ ᓄᔅᓗ ᒪᑲ ᐊᐩ ᑭᐩ ᔪᐅᑦᑕ ᐊᓄ ᓀᕐᓴ ᐊᔪᒪᑭᓄᐧᐃᓴ ᑭᐩ ᒥᑦᑎᔪᐧᐃᓚᓵ ᓄᔭᑭᐤ ᐧᐃᐃᔭᐧᐊ ᒥᑦᑐᐧᑐᑎᓄᐧᐤ ᑭᐩ ᐃᑎᔪᐧᐃᓚᓵ ᐊᐧᐊᓄᑭᓵ ᓄᒪᐃ ᐅᐩᑭ ᑭᔭᑭᐩᐅ ᐊᓄ ᐊᐧᐊᓄ ᑲ ᒪᑎᓄᐧᐊᔪᐧᐊᑦ (ᑎᐱᔪᐧᐊᕐ) ᐊᐩ ᐊᑭᔭᒋᓵᓵ

ᑦᓄ ᑎᐢᑐᓕᔪ ᑭᐱᐢ ᑭᐩ ᐃᑎᐧᔪᐤ ᕐᓂᐧᓀ ᓄᔭᐢ ᒥᓗᐧᐊ ᐊᐧᐊᓕᐤᐢ ᐞ ᑭ ᐊᔪᒪᓵᓵ

<u>If you want to know more:</u>
Native American Mathematics, edited by Michael P. Closs, University of Texas Press, Austin. 1986.
This book does not speak about Cree, but an article by Peter Denny looks at Ojibwe and Inuktitut and there are a lot of similarities with Cree: Chapter 6. Cultural Ecology of Mathematics.J Peter Denny. pp 129-180.