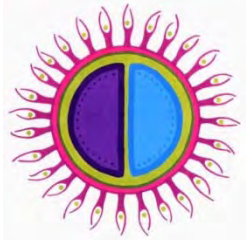


CO-LEARNING: Indigenous and Western sciences talking and walking together ... *a journey with some methodology insights*

presentation for:



Aboriginal Studies Program **- ABS460Y Aboriginal Methodology**

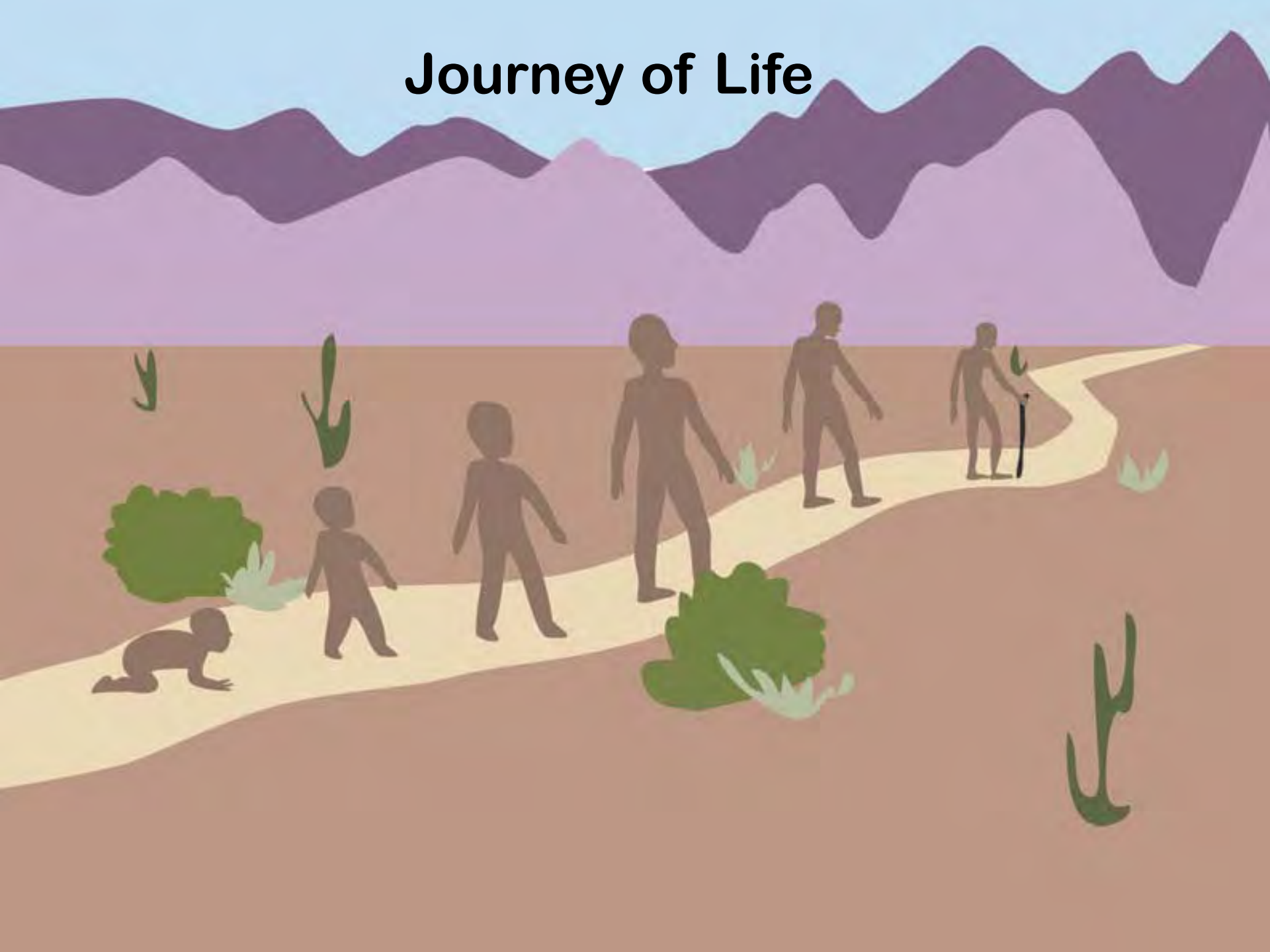
University of Toronto (Distinguished Lecturer Series)
7 November 2007

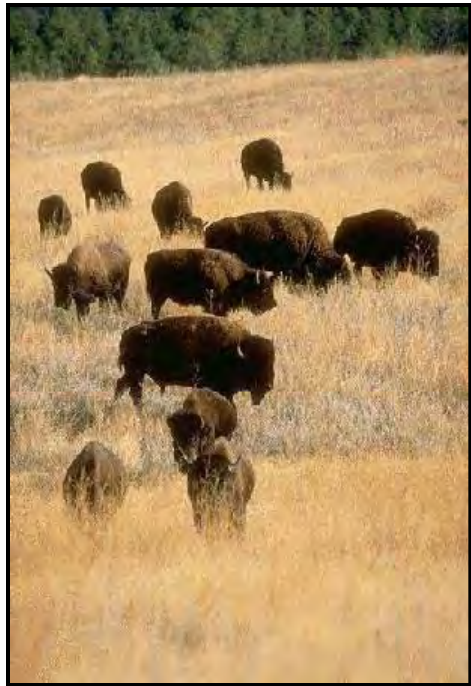
Cheryl Bartlett, PhD
Canada Research Chair
in Integrative Science

CAPE BRETON
UNIVERSITY



Journey of Life

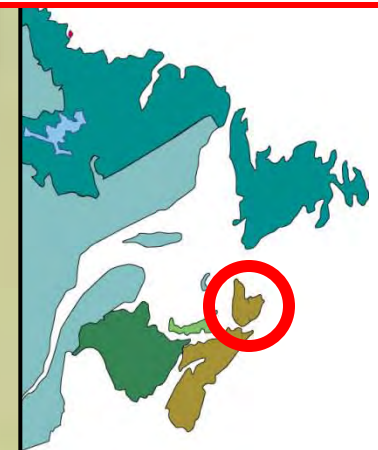






CAPE BRETON UNIVERSITY

Cape Breton Island
Unama'ki (*Land of Fog*)





Canada Research Chairs / Chaires de recherche du Canada / Canada

Social Sciences and Humanities Research Council of Canada / Conseil de recherches en sciences humaines du Canada

Canada Foundation for Innovation / Fondation canadienne pour l'innovation

CAPE BRETON UNIVERSITY



CIHR IRSC / Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Mi'kmaq College Institute / Mi'kmaq Espi Kina'matno'kuom



IWK Health Centre Foundation

IAPH

ATLANTIC ABORIGINAL Health Research Program

Mi'kmaq Elders

NOVA SCOTIA Health Research FOUNDATION

SABLE OFFSHORE ENERGY INCORPORATED

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

KECCA Knowledge: Education and Cultural Consultant Associates

NSERC CRSNG

Mi'kmawey Debert

Eskasoni Detachment Royal Canadian Mounted Police / Gendarmerie royale du Canada

Co-Learning Journey

A shared understanding of how to talk together

This visual is based on the Medicine Wheel (or Circle of Learning) which is a commonly used Aboriginal teaching tool. The visual shows that within the discussion, all have a role to play. Each person has an opportunity to speak, to share, to teach, and to learn.



Each participant gains some new understandings of Mother Earth and her lessons for humans about health, healing and wholeness based on sharing, listening, and discussing.



**10+ years: where our journey
has been and continues to be ...**

Science

Indigenous

Western

The central dilemma of science education today is the teaching of science from only one cultural perspective, and in an incomplete and non-connected manner.

Gregory Cajete, PhD, scientist & educator, Univ. of New Mexico

Indigenous

Western

**10+ years: where our journey
has been and continues to be ...**

Integrative Science

**bringing together Indigenous and Western
scientific knowledges and ways of knowing**

Indigenous

Western

Integrative Science



Integrative Science

SCIENCE

education, research, applications,
youth and community outreach

Indigenous

our sciences
our stories

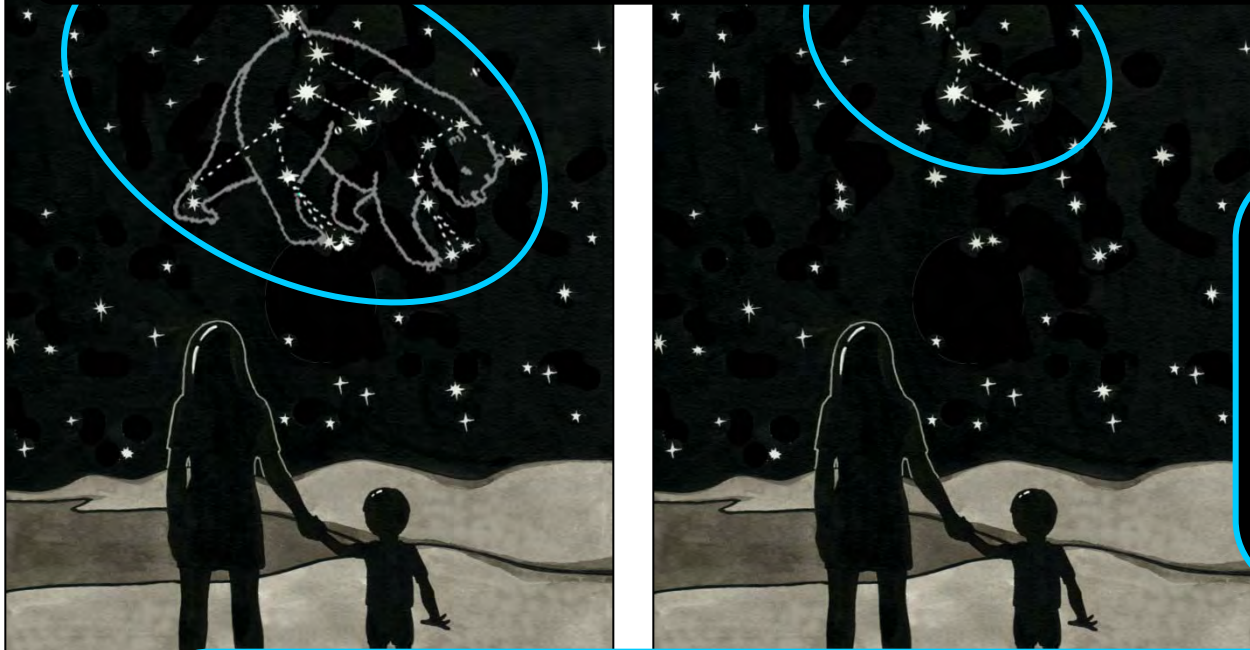
Western

“bringing our knowledges together”

our worldviews

stories of our interactions with and within nature

Science: dynamic, pattern-based knowledge



the patterns
that we see
within nature
reflect our ...

**SANCTIONED
PERSPECTIVES & INTELLIGENCES:**
who we are; where we are; where we were;
what we know, do and value

Co-Learning: Indigenous and Western sciences talking and walking together ... a journey with some methodology insights

1. walk-talk
2. knowledge in the land
3. naturalized models
4. evidence enriched



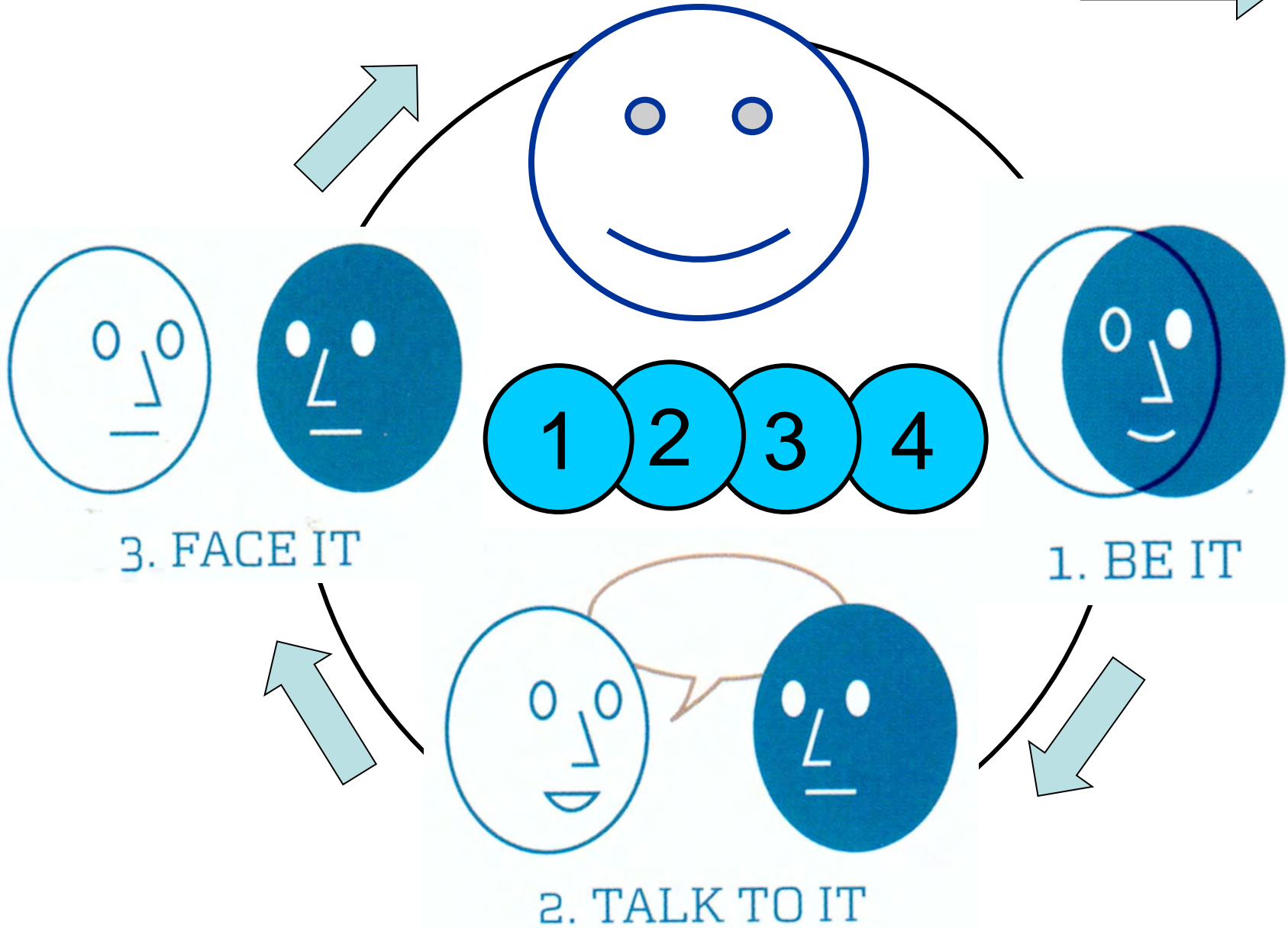
Insight #1:

**“WALK”
as well as talk.**

We must become able to put the “**know, do, value**” aspects of our worldviews in front of us ... like an object ... and then we must develop the abilities to walk around them ... to acknowledge them, take ownership of them, understand them, and put them beside those of another worldview ... to see our mutual strengths and to begin working together in a reciprocally respectful manner.



4. "KNOW, VALUE, and DO" IT ... SHARE IT ... and GROW IT



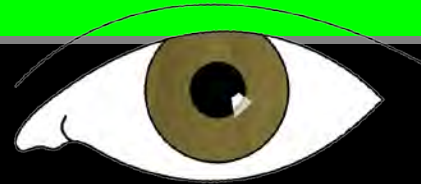
1

Two-Eyed Seeing

our key concepts & actions



- respect
- relationship
- reverence
- reciprocity
- ritual (ceremony)
- repetition
- responsibility



- hypothesis
(making & testing)
- data collection
- data analysis
- model & theory
construction

2

Two-Eyed Seeing our language & methodology



vigour

WEAVING



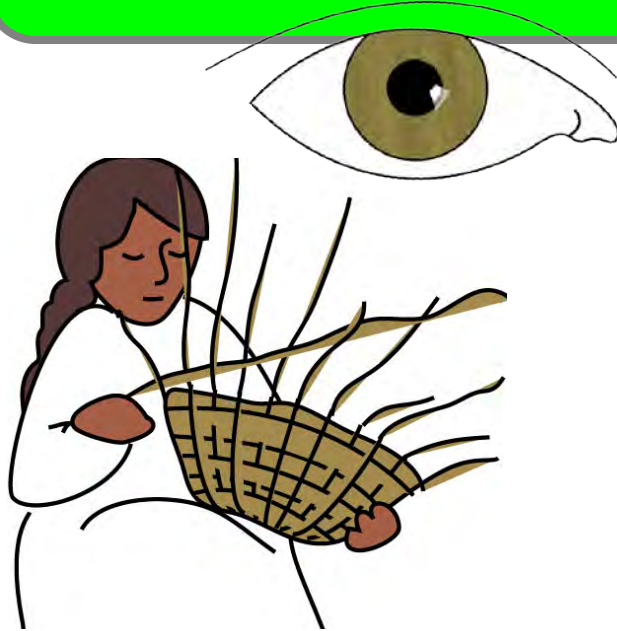
rigour

UN-WEAVING

3

Two-Eyed Seeing

our overall knowledge objective



towards resonance
of understanding
within environment

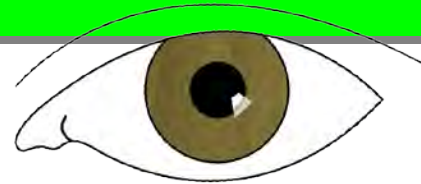
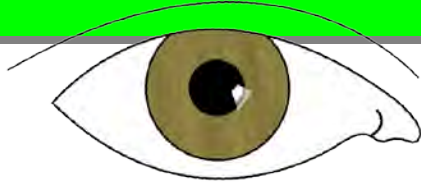


towards construction
of understanding
of environment

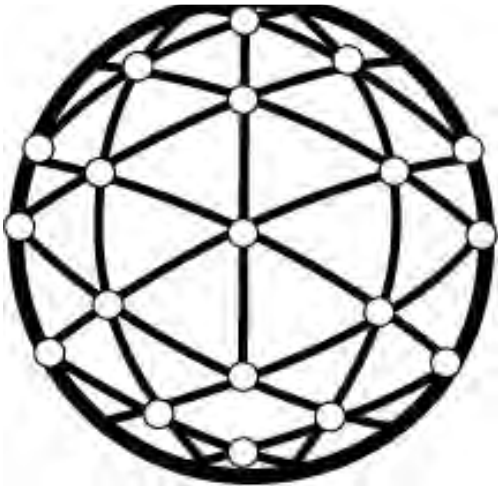
4

Two-Eyed Seeing

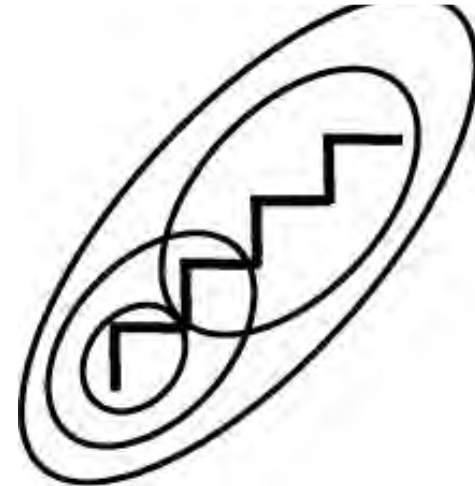
how our world is



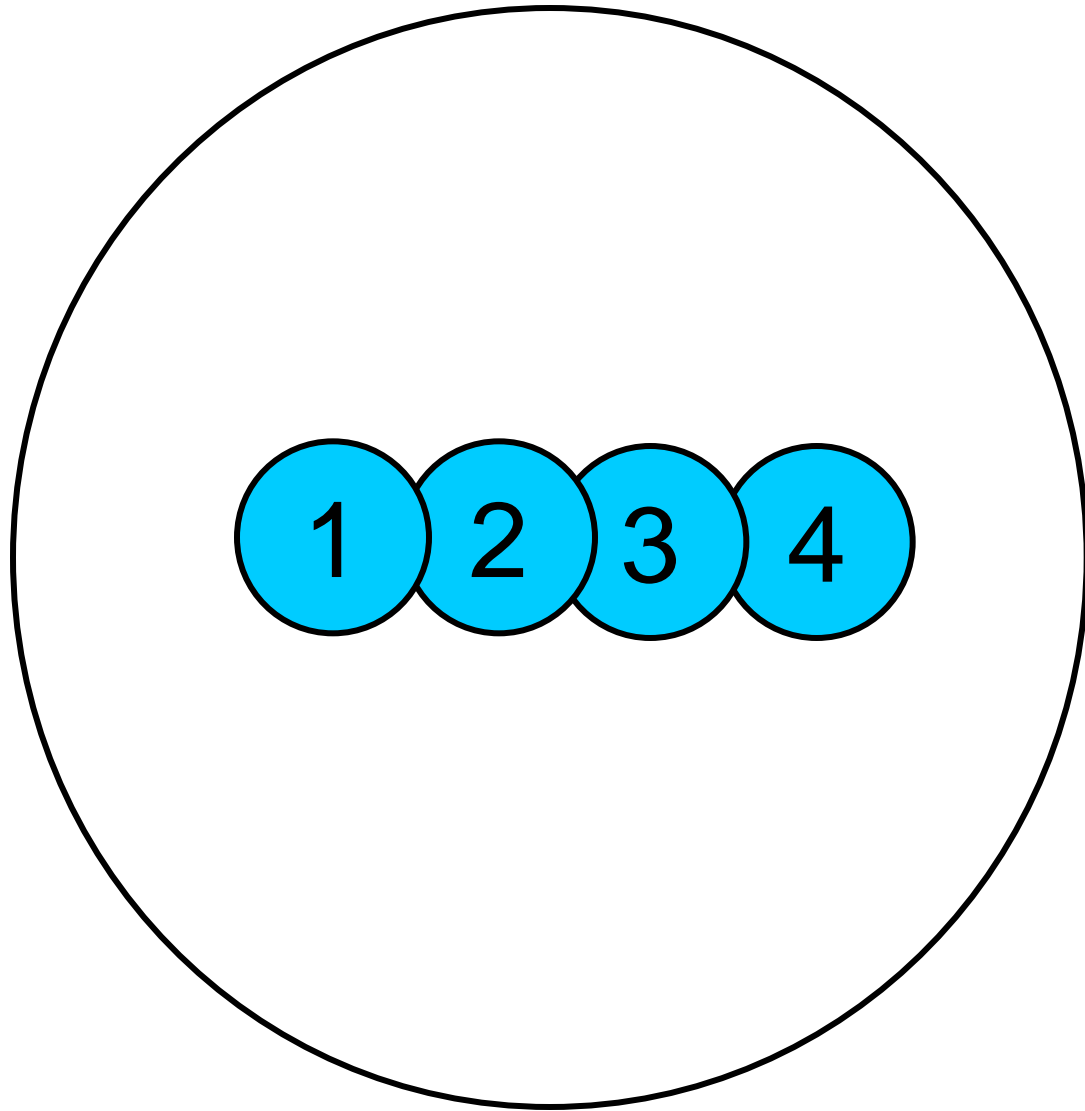
interconnective



parts & wholes



role of the knower in the knowing

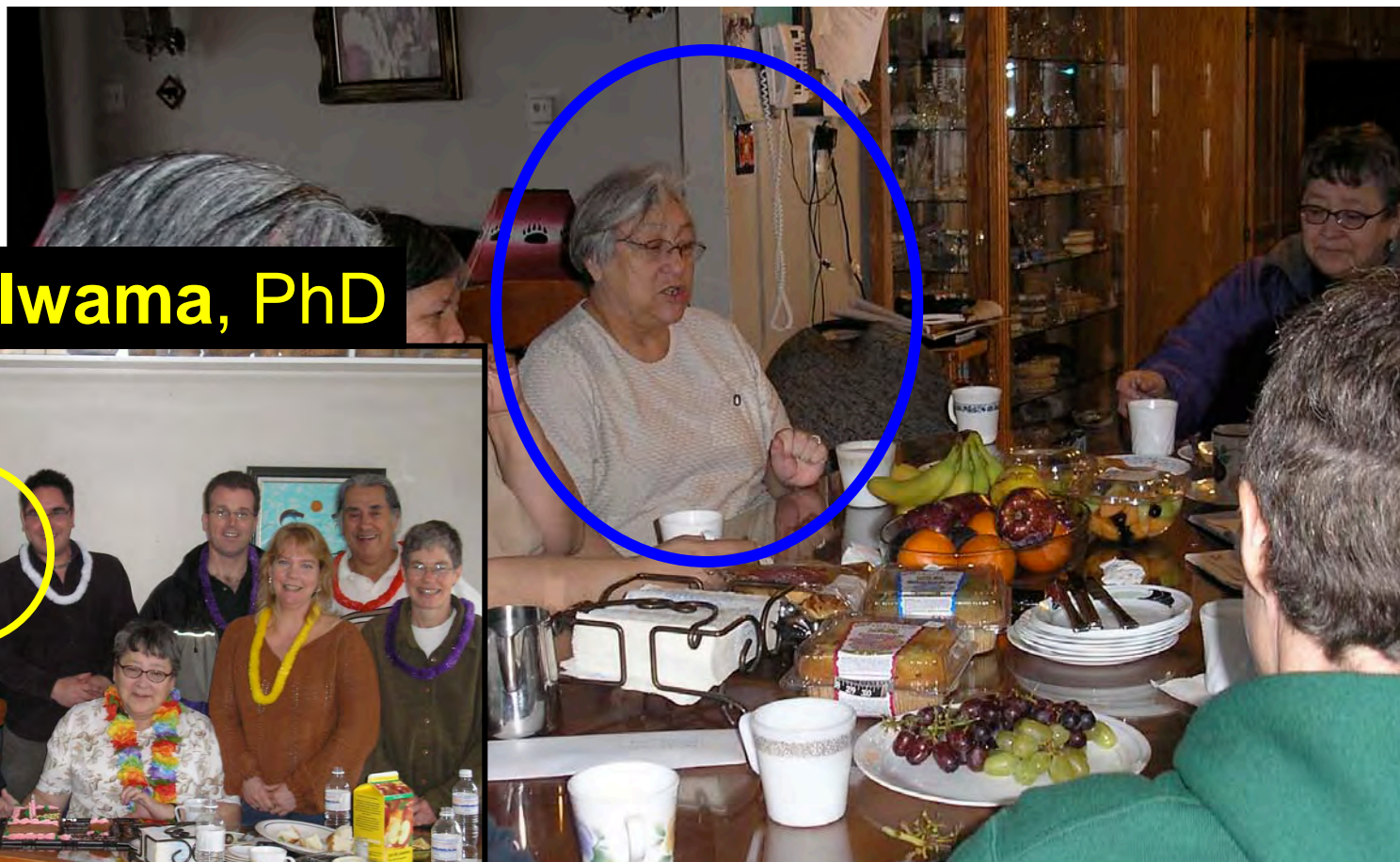




Insight #1:
["WALK"
as well as talk.]

**= an extension
of understandings
from discussions
about healing
language.**

Mrs. Murdena Marshall BEd, MEd
Elder and Spiritual Leader, Mi'kmaq Nation
Eskasoni First Nation, Nova Scotia
Associate Professor (retired), Mi'kmaq Studies, CBU



Marilyn Iwama, PhD



Murdena Marshall:

There's something called the
healing tense.

THE HEALING TENSE ... an example

Mi'kmaq

English

Ketkiayop

I was drunk

Keskiayasa*nek*

I was drunk

We Heal Together

*"... when he goes into this healing tense,
then my attitude has to change ...
everybody in the household ...
everybody ... has to abide with him."*

Murdena Marshall

Generalize

kesnukwiap – I was sick

kesnukwias *nek* – I was sick

An aerial photograph of a dense forest, showing a mix of green and brownish trees, suggesting a natural or semi-natural woodland. A prominent green rounded rectangle is overlaid in the upper left quadrant, containing white text. The text is arranged in two lines: the first line is in italics and the second line is in a standard font.

Nipuktuk Wejiaql A'tukuaqnn:
From the Forest Comes Our Story

How Bullfrog was Conquered



How Bullfrog Learns His Lesson

Epilogue

Bullfrog: I know now that I was selfish and caused much suffering. I was wrong.



The Healing Tense Heals

“[Bullfrog] has taken his misdeeds and placed them in front of him and walked around them, and said yes, I was there.”

Murdena Marshall

... in conversation with Dr. Ivar Mendez, Director,
Brain Repair Centre, Dalhousie University



Love is the main ingredient of wellness.

- *Murdena Marshall*

We heal together

... when he goes into this healing tense, then my attitude has to change ... everybody in the household ... everybody ... has to abide with him.



Love is the main ingredient of wellness.

- *Murdena Marshall*

The voice of our language is in the land.

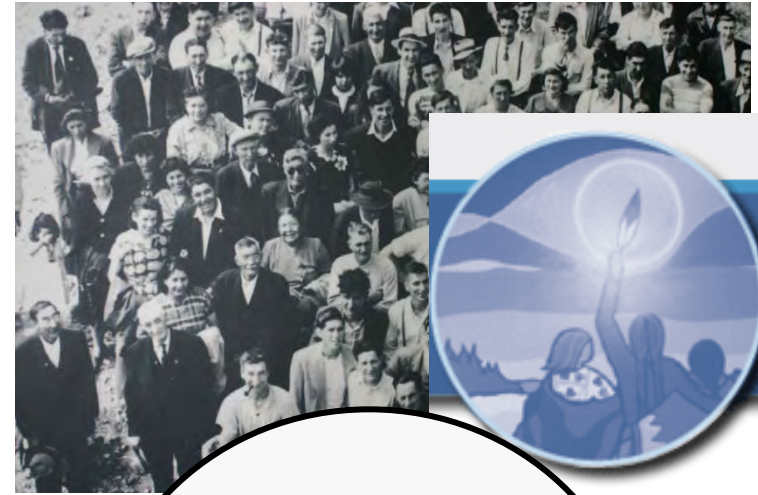
- *Albert Marshall*



Insight #2:

**Walk and talk
with the land.**

Our voices are in the land.



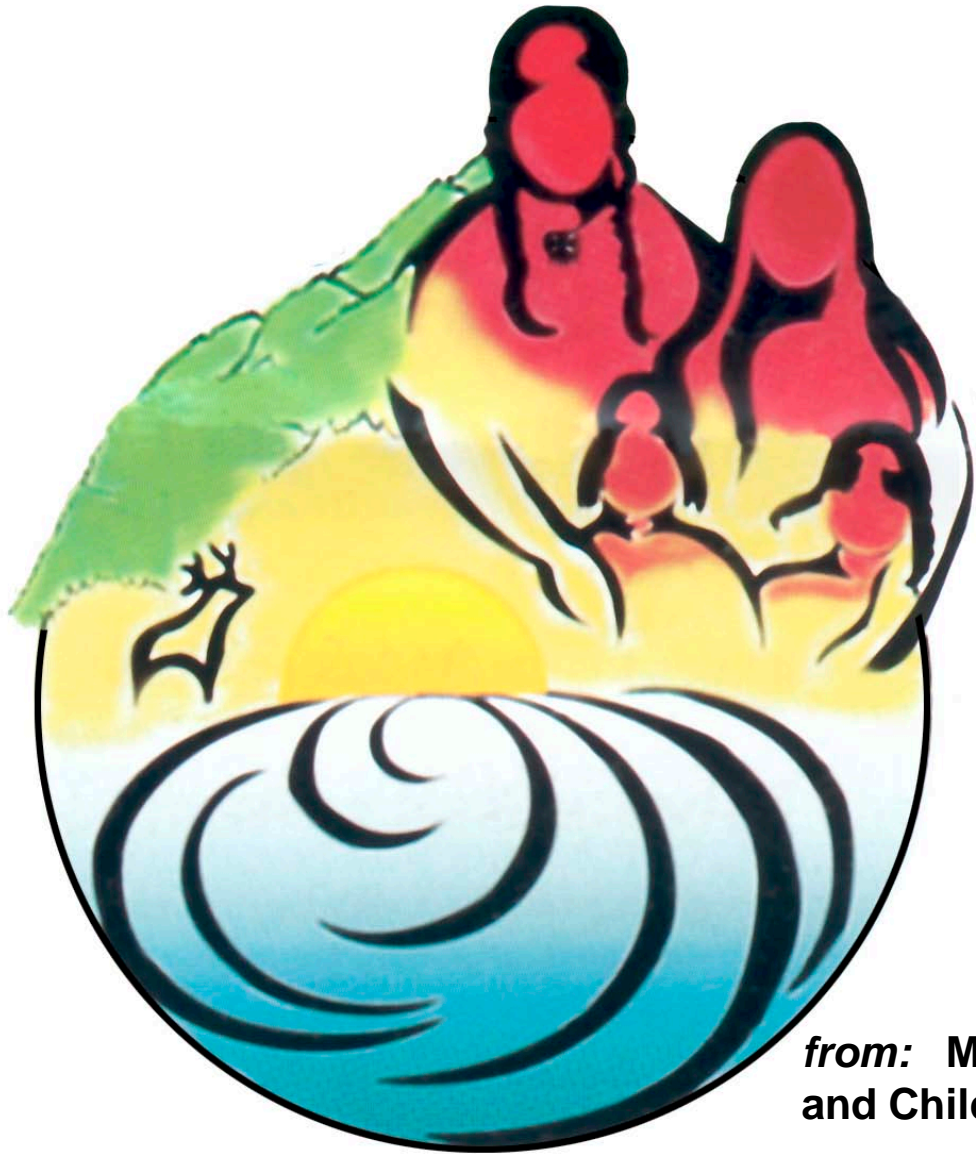
**Life
Love
Land**





**We need to
stay connected
to the earth ...
... and work
with Nature ...
... not be a
“master over”.**

**Artist: Rod Restoule
from: Into the Daylight;
C. Morrissette, 1998**

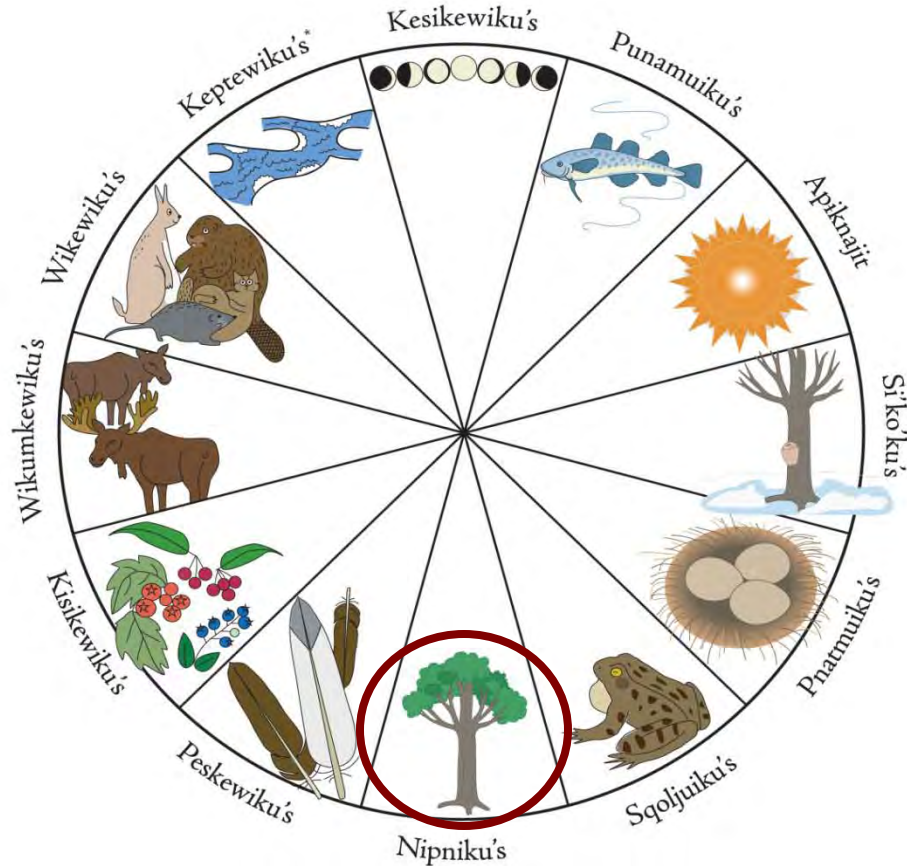


**We are
all inter-
connected.**

from: **Mi'kmaq Family
and Children Services**



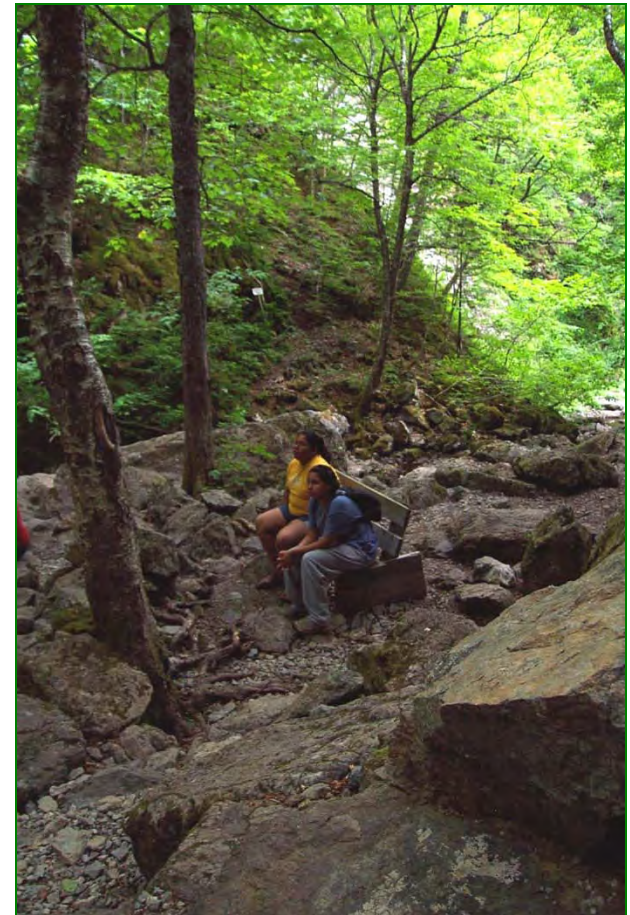
Mi'kmawe'k Tepknusetk



*Alternative - Keptewiku's

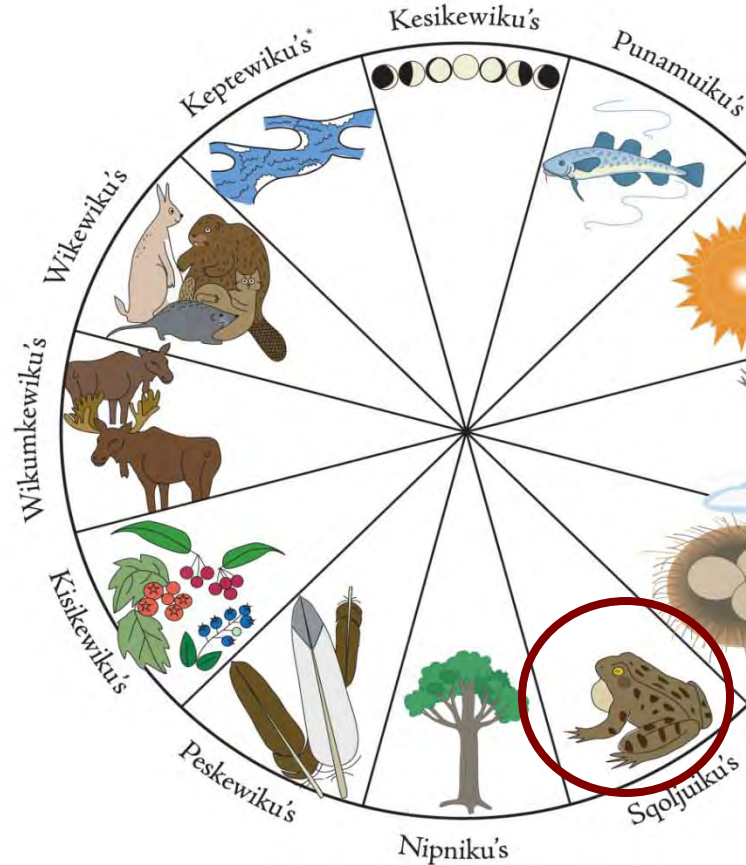


Earth speaks: forest time





Mi'kmawe'k Tepknusetk



*Alternative – Kepti'kewiku's



Earth speaks: health indicators

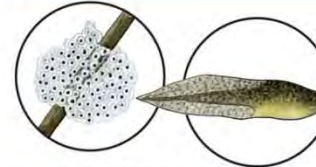
ECOSYSTEM HEALTH CONSCIOUSNESS Difference, Pattern, Variation

TOQWA'TU'KL KJIJITAQNN • INTEGRATIVE SCIENCE

Frogs of Unama'ki



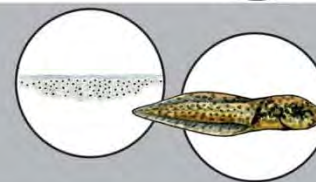
Mink Frog



Mink Frog • *Rana septentrionalis*
 Mink Frog is green with many dark markings and is 4 – 7 cm long. He gets his common name from his musky odour; he smells like a mink. Mink Frog's song sounds like pieces of wood being rapped together ... TAP TAP! While other frogs live on both land and water, Mink Frog spends most of his life in the water. He prefers permanent bodies of water like ponds and lakes. Female Mink Frog lays 2000 to 4000 eggs in a round jelly mass. This jelly mass is attached to an underwater plant stem or submerged twig. Mink Frog eats dragonflies, damselflies, water beetles, aphids, minnows, leeches, snails, millipedes, and spiders.

MINK FROG

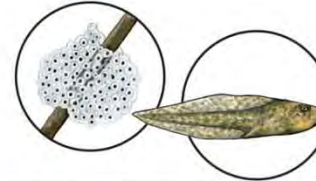
Green Frog



Green Frog • *Rana clamitans*
 Green Frog is green with gray or brown markings on her back and legs, and has a pale belly marked with dark streaks. Male Green Frog has a bright yellow throat and is 6 – 10 cm long. Green Frog's song sounds like a loose banjo string being plucked, or like a small pebble dropped into water ... LINGKI! Green Frog prefers to be close to water, and tends to live at the edge of rivers, ponds, lakes or streams. Female Green Frog lays 1000 to 4000 eggs in a loose jelly mass that floats on the surface of the water like a raft. Green Frog eats beetles, flies, caterpillars, grasshoppers, spiders, snails, slugs, waterbugs, butterflies and moths, and sometimes other small frogs.

GREEN FROG

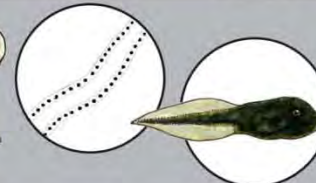
Pickerel Frog



Pickerel Frog • *Rana palustris*
 Pickerel Frog is light brown with many dark blotches on his back and legs. He is 4 – 7 cm long. Pickerel Frog's song sounds like somebody snoring, or like the sound of someone slowly pushing open a creaky door ... ARREP ARREP! Pickerel Frog lives on the shores of ponds or lakes, or on the banks of streams, often staying near permanent bodies of water at breeding time. However, he will also live in moist fields, bogs, or damp woods. Female Pickerel Frog lays her eggs in a round jelly mass attached to a plant or stick below the surface of the water. She can lay as many as 800 to 1800 eggs at a time. Pickerel Frog eats beetles, ants, spiders, caterpillars, snails, slugs, snails, true bugs, and many small water creatures.

PICKEREL FROG

Eastern American Toad



Eastern American Toad • *Bufo americanus*
 Toad is a plump creature with stubby toes and rough, warty skin. He is usually brownish, with darker brown or black markings. Toad has a pale belly with dark spots that become more distinct at night. Toad can grow to be 5 – 11 cm long. Toad lives in many different places, for example, in the woods, near a swamp or lake, in a field, or even in your backyard! His song sounds like a long, high trilling sound ... THRRR! Female Toad prefers temporary ponds for breeding. She lays 8000 to 80000 eggs at a time in two long strings near the bottom of the pond or puddle. Toad eats many kinds of insects like caterpillars, earwigs, saw bugs, as well as slugs, earthworms, and millipedes.

AMERICAN TOAD

Northern Spring Peeper

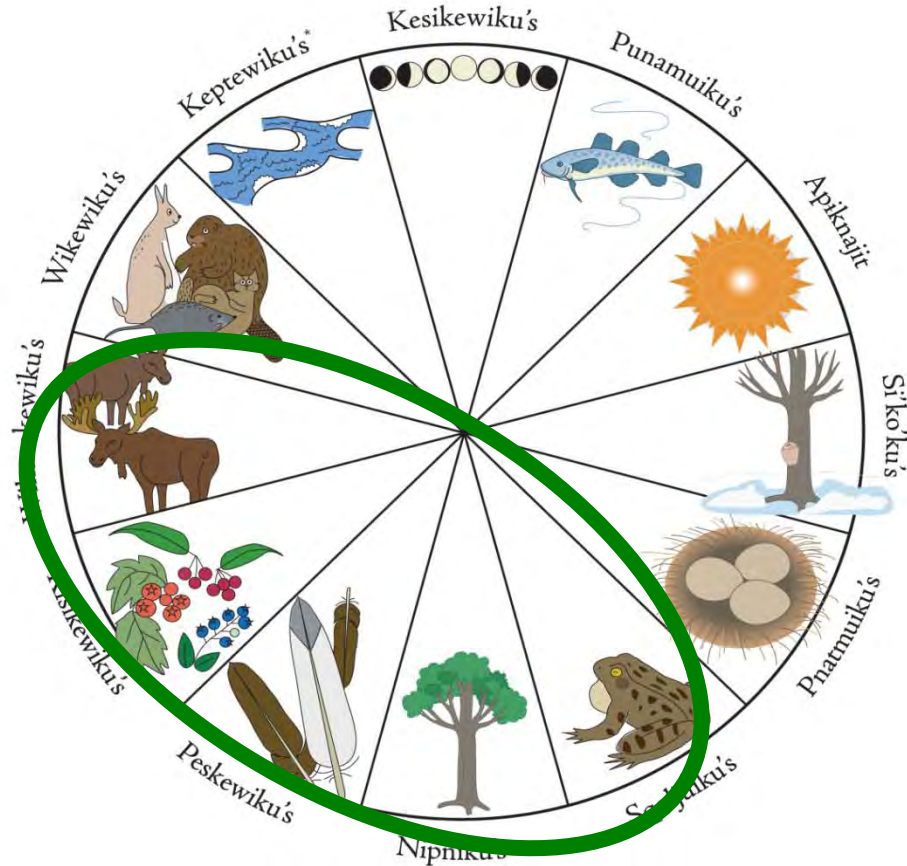


Northern Spring Peeper • *Pseudacris crucifer*
 Spring Peeper is our smallest frog; he grows to 2 – 4 cm long. We know that spring has arrived when we hear Spring Peeper singing at night. His song sounds like a high PEEP! Spring Peeper lives in the woods near ponds, marshes or swamps. He is our only tree frog and can change the colour of his skin to blend in with his

SPRING

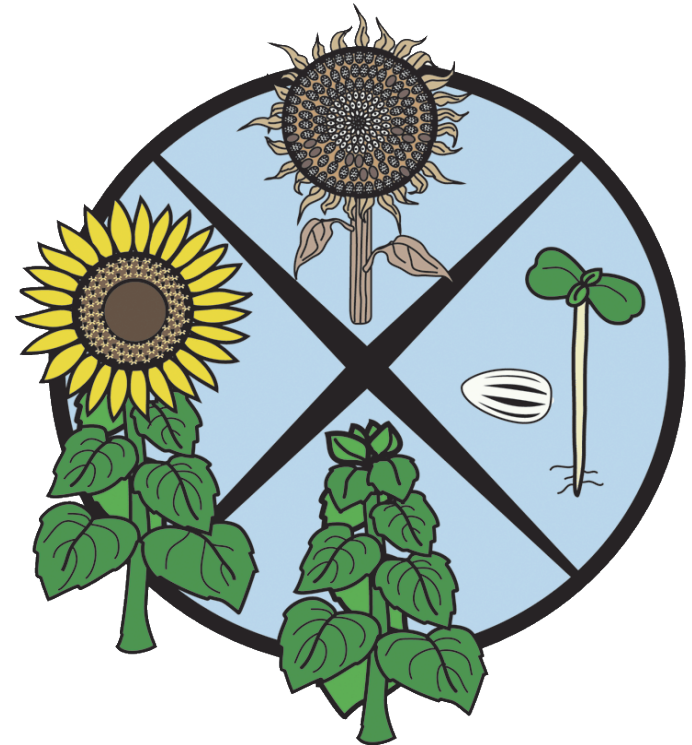


Mi'kmawe'k Tepknusetk

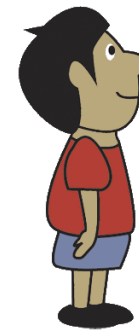
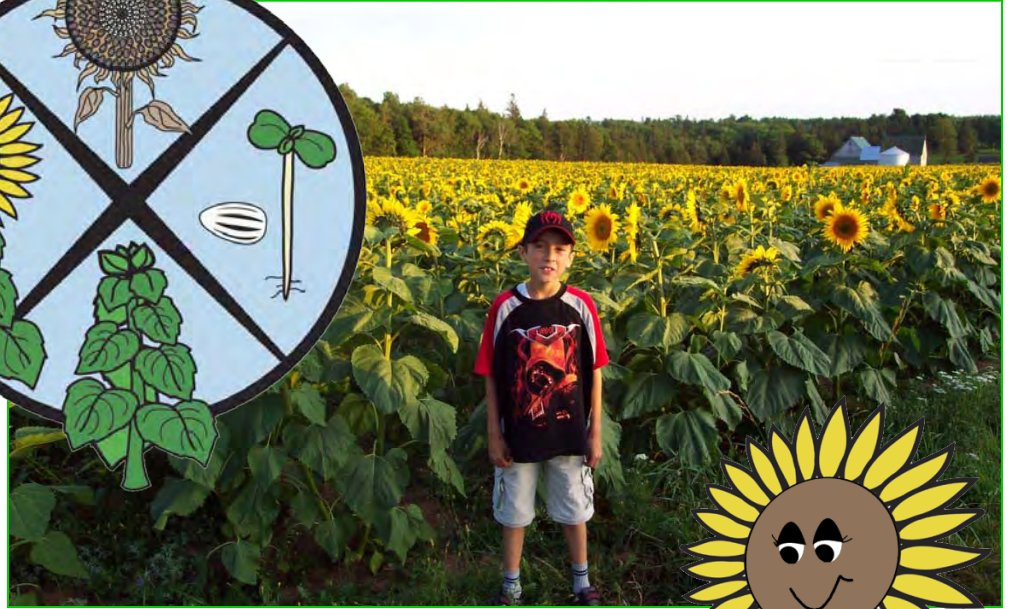


*Alternative – Kepti'kewiku's

Earth speaks: wholistic health lessons




healthy young ... need TLC



puppets made from the Earth

TOQWA'TU'KL KIJITAQNN
Integrative Science

Nipuktuk Wejiaql A'tukuagqnn
FROM THE FOREST COMES OUR STORY



Apl'ikmuj
Lepus americanus
SNOWSHOE HARE

Kaqajulman
Clintonia borealis
BLUE BEAD LILY

Pukusp
DECAYING WOOD

Kawatk
Picea sp.
SPRUCE CONE

Stoqn
Abies balsamea
DWARF FIR

Wso'qmanaqsil
Cornus canadensis
BOWENBERRY


Oqnn
TWIGS

Kuow
Pinus strobus
PINE NEEDLES

Apl'ikmuj - Hare gets very nervous in the night, even larger than the coming of winter because the fire scares much the time when, but new for each will arrive. Hair summer coat of brown changes to a winter coat of white. Hairy winter coat is like the white winter snow and has summer coat like the brown summer earth and forest floor. These different colors camouflage her making it difficult for predators to see her in the environment. While wearing her summer coat, Hare will hunker down, close grasses, ferns, and flowers. In her winter coat, she eats bark and small twigs of pine and spruce trees. *Apl'ikmuj* is a beloved character in many Mi'kmaq legends.

A small multicultural group of young people worked at the University College of Cape Breton during the summer of 2004 to make puppets for the characters in two Mi'kmaq legends: *Haw Rabbit Got His Long Ears and How Bullfrog*. The characters in Mi'kmaq were made from natural materials with reference to the forest of the Mi'kmaq - Cape Breton. The project was part of a larger research effort to help people learn and understand Mi'kmaq and modern scientific understandings of our forests and ecosystems within coastal ecosystems, especially as the climate continues to change and human use of the area is ever more of this enterprise and contemporary. This large project is funded by the Canadian Government of Health Research - Institute of Aboriginal Peoples Health.

For Mi'kmaq legend information visit: www.mikmaq.ca (902) 779-2200
for additional information contact: Integrative Science Program - University College of Cape Breton - P.O. Box 17000 - Sydney - Nova Scotia - B1P 0L2. E-mail: is@ucb.ns.ca



TOQWA'TU'KL KIJITAQNN
Integrative Science

Nipuktuk Wejiaql A'tukuagqnn
FROM THE FOREST COMES OUR STORY



T'itikli
Bubo virginianus
GREAT HORNED OWL

Jikoqs
Fomes fomentarius
BRACKET FUNGUS

Kuow
Pinus strobus
PINE NEEDLES

Maskwi
Betula papyrifera
BIRCH BARK

Wisqasaw
Pinus strobus
PINE CONE

Pukusip
Dicranum sp.
Moss

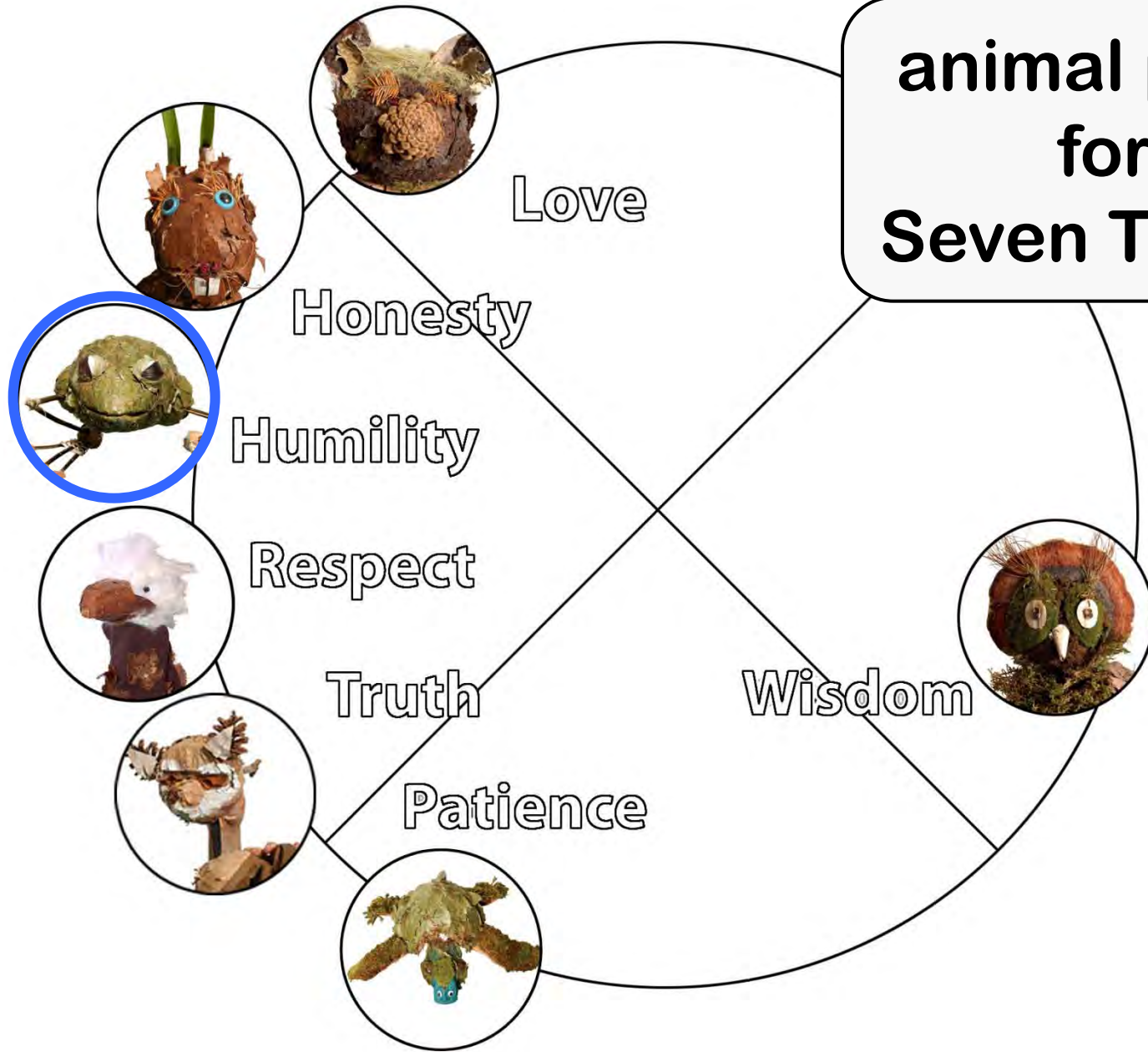
Oqnn
TWIGS

Ulnetkul

Jikoqs - BRACKET FUNGUS: This hard, woody, slow growing bracket fungus once had a very special role to play in the life of the Mi'kmaq Nation. Jikoqs, Keeper of the Sacred Flame, was used to ensure that embers of the fire remained alive when the people moved to a new camp. The fungus was set on fire and then placed in a clamshell for protection. Jikoqs would burn slowly and thus *keep the fire alive*. At the new campsite, Jikoqs would be used to start a new campfire - this was in the time before we had modern matches. Similarly, to ensure that the fire could be restarted every morning at the same campsite, Jikoqs and a clamshell were used to safeguard an ember each night. The species of fungus used was possibly *Fomes fomentarius*, which is known in English as *tinder* (many tiny holes (tinder polypore)).

A small multicultural group of young people worked at the University College of Cape Breton during the summer of 2004 to make puppets for the characters in two Mi'kmaq legends: *Haw Rabbit Got His Long Ears and How Bullfrog*.

animal puppets for the Seven Teachings





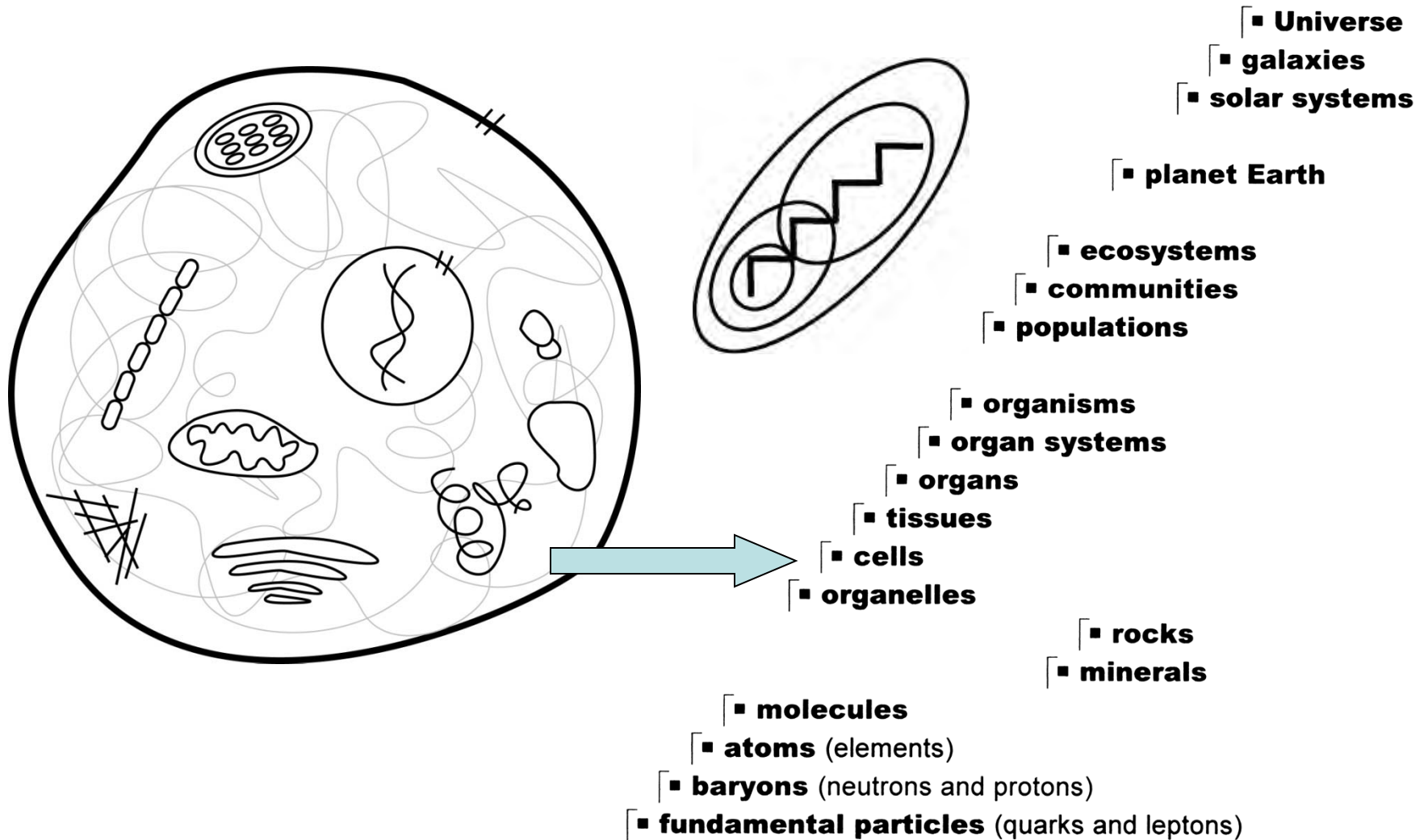


Insight #3:

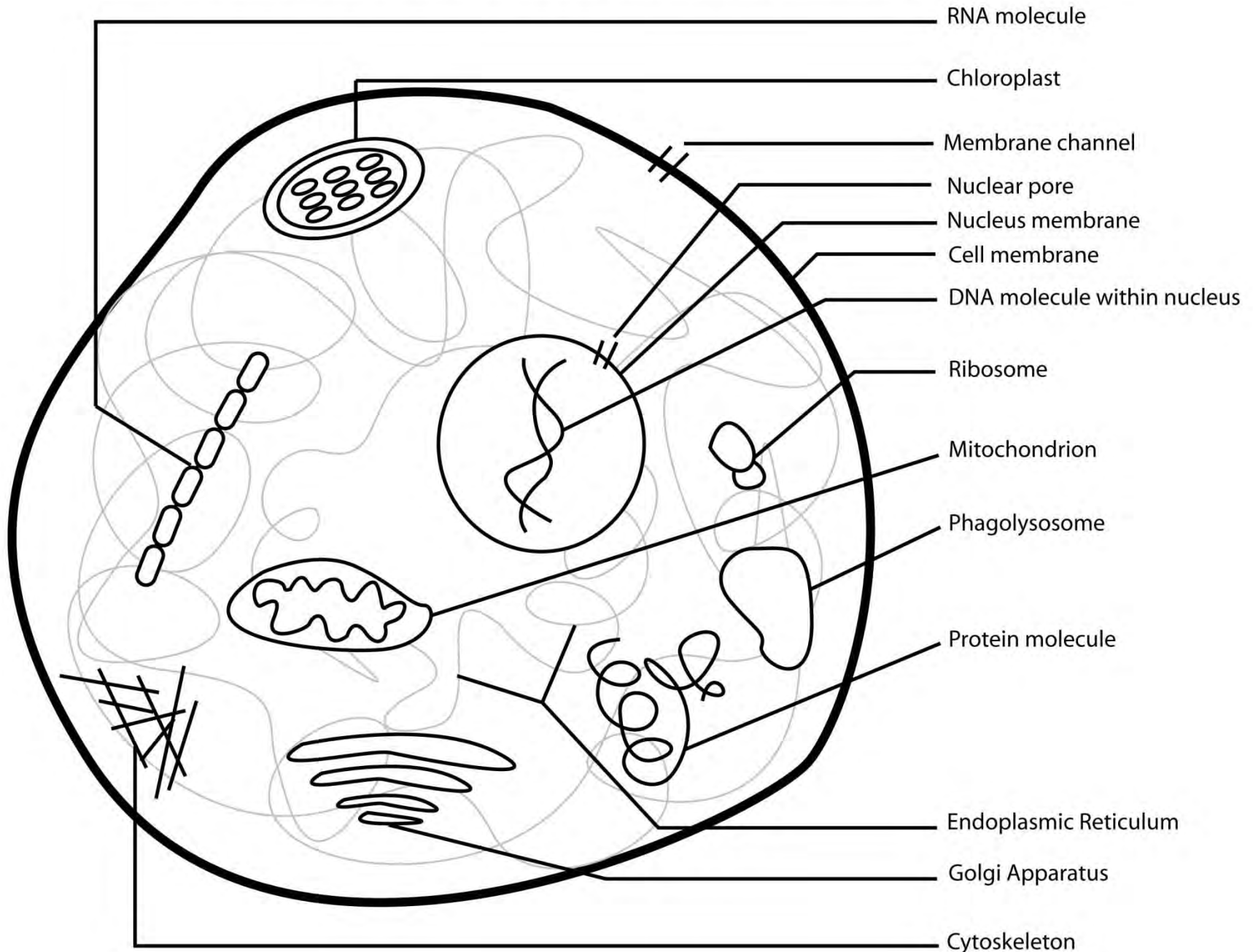
**Walk and talk
... using
naturalized
models and
metaphors.**

HOLARCHY

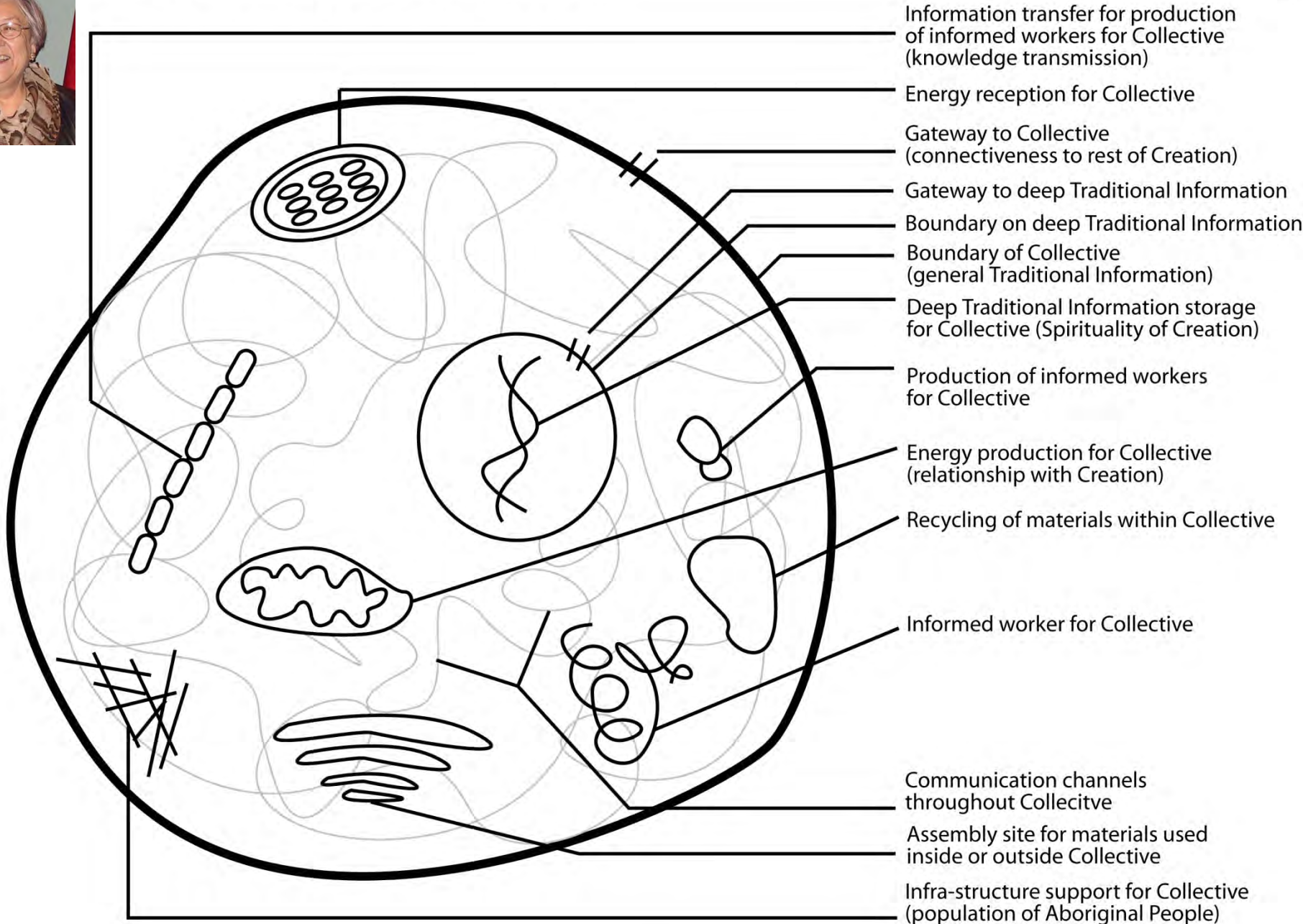
- VISIBLE MATTER IN THE UNIVERSE -

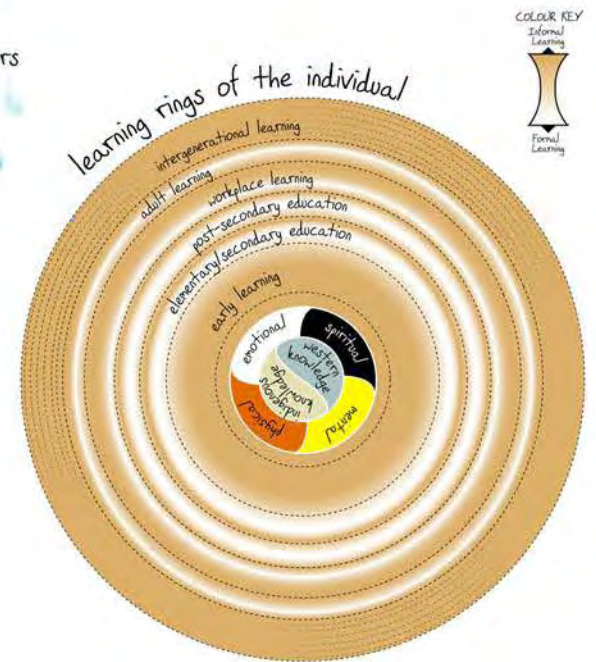
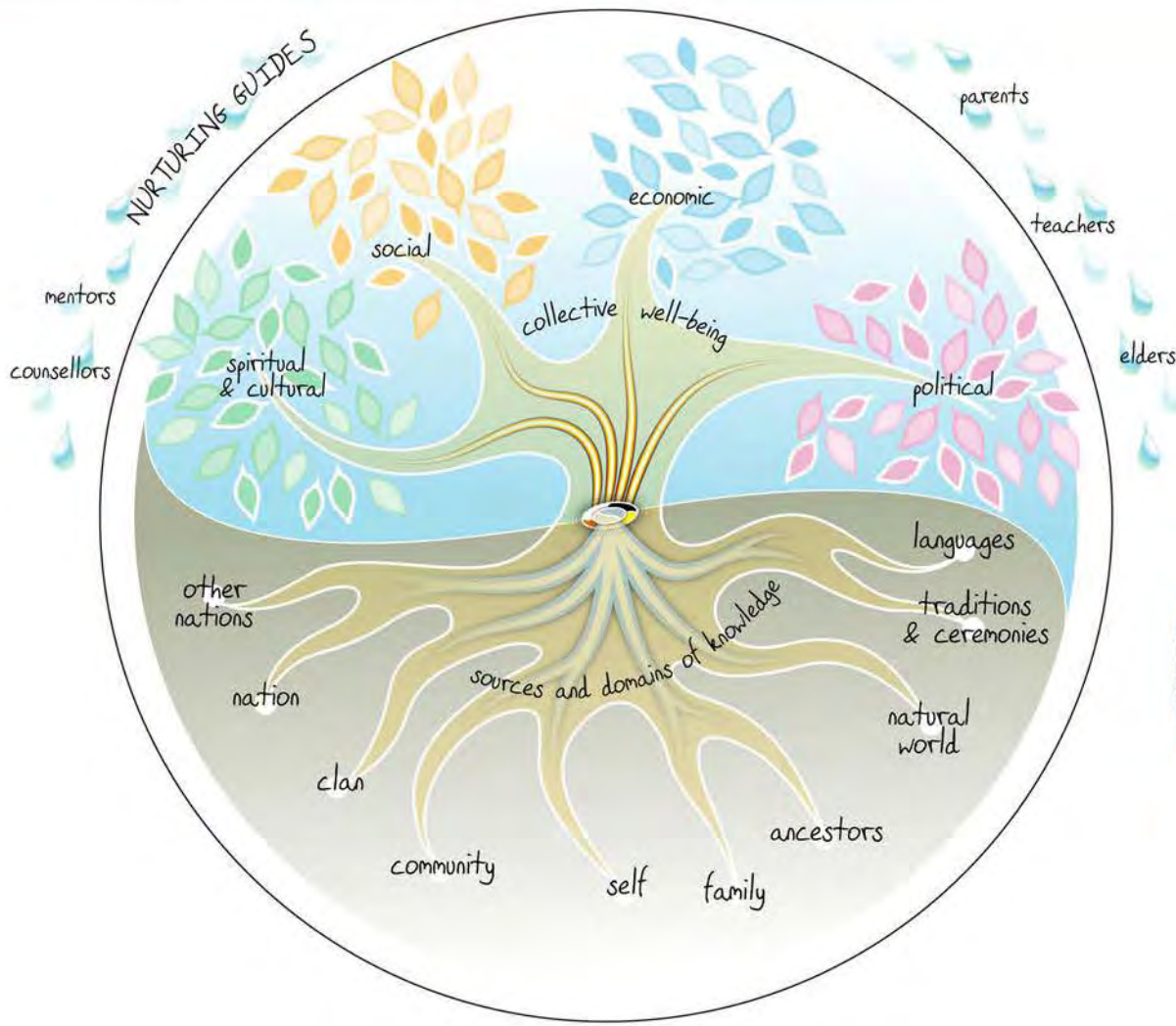


The Collective: Its Parts (example = the living cell)



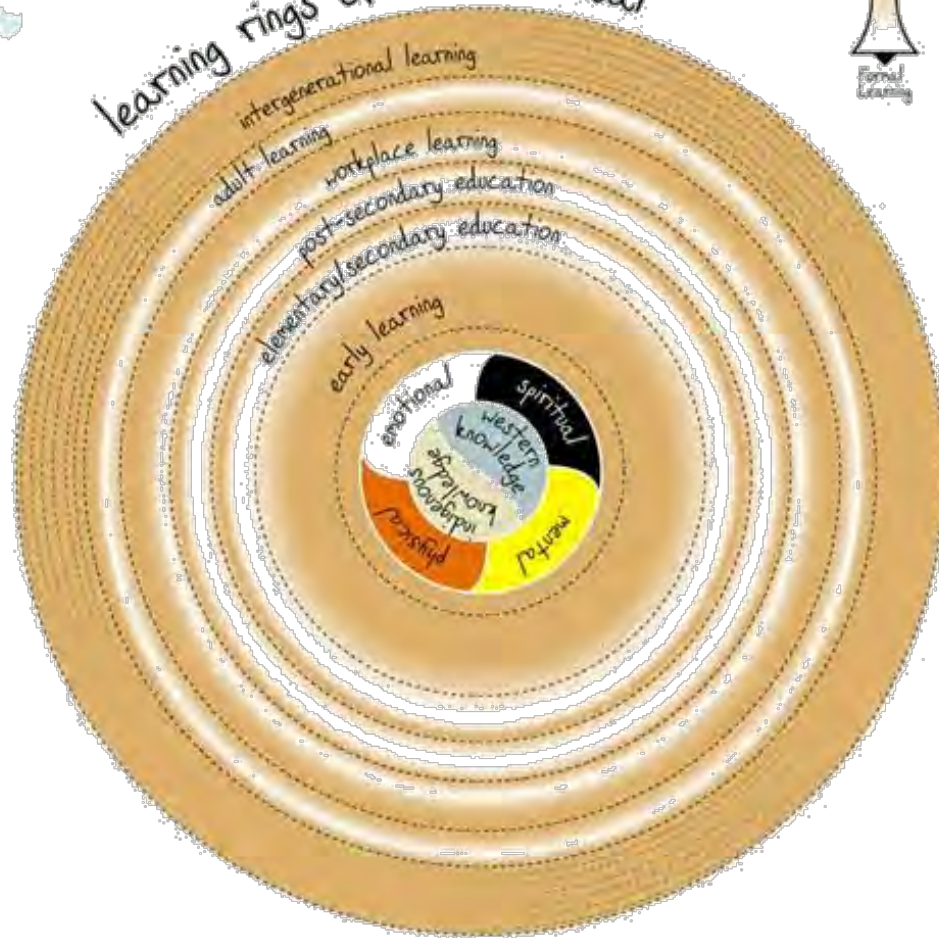
The Collective: Its Functions (by Murdena Marshall BA, MEd)





rs


learning rings of the individual



Aboriginal Learning Knowledge Centre – Canadian Council on Learning



Aboriginal Learning Knowledge Centre – Canadian Council on Learning

learn to see with the strengths
of each & together



Indigenous

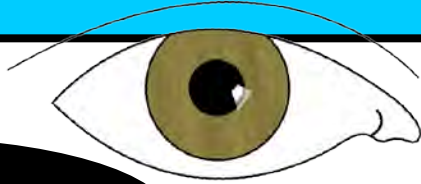


Western



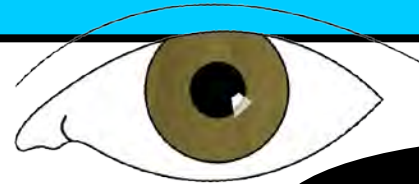
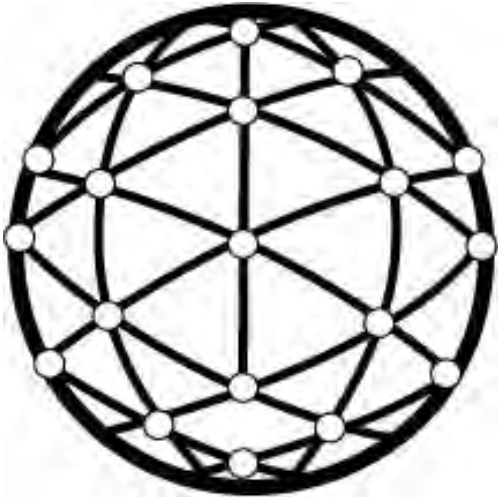
Two-Eyed Seeing

Two-Eyed Seeing how our world is



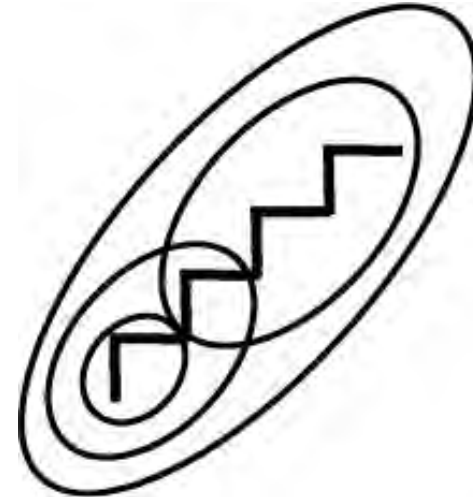
Indigenous

interconnective



Western

parts & wholes

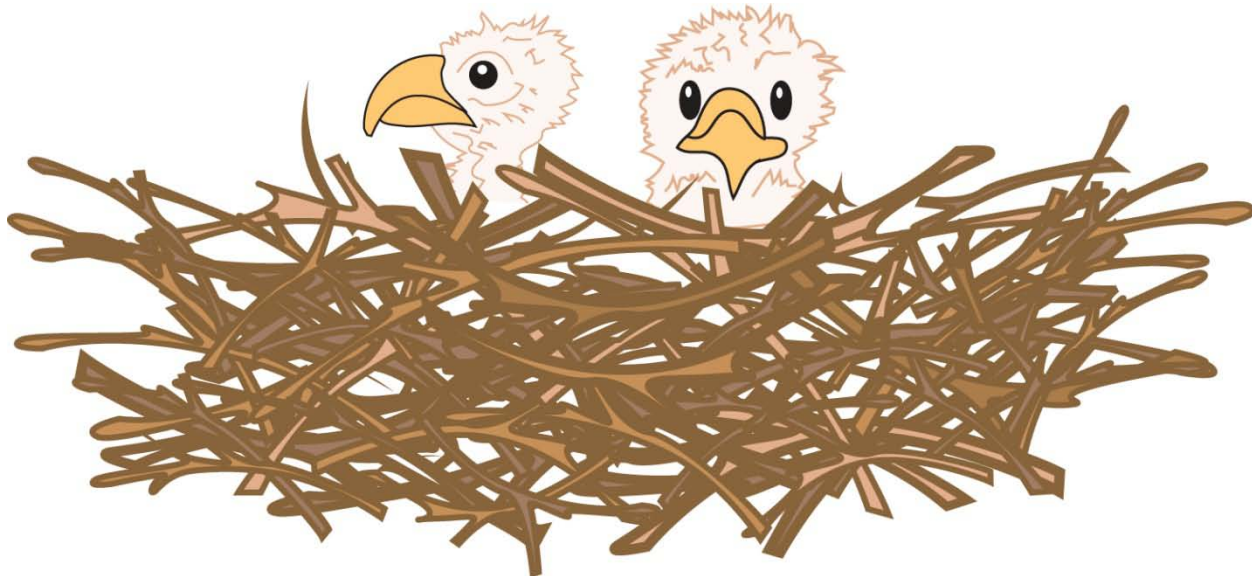




Insight #4:

**Walk and talk
... accepting
diverse styles
of evidence.**

**Social Determinants of Health:
NCC-DH Think Tank (7 March 07, Halifax)
What is evidence? What knowledge context?**



Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax)

What is evidence? What knowledge context?

Who wants this evidence?

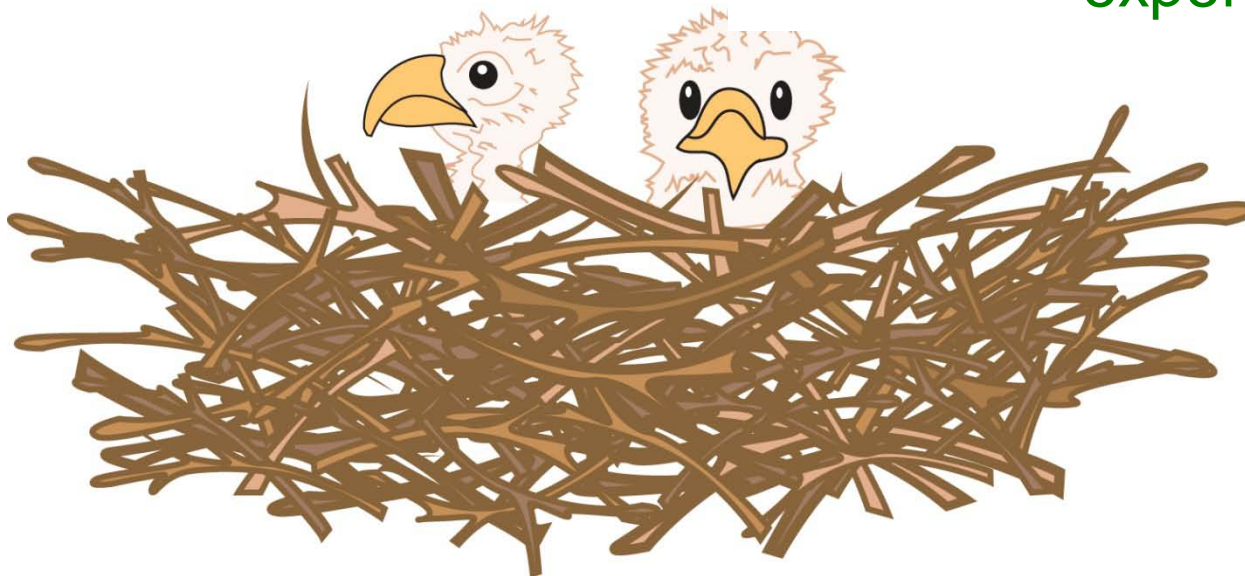
Those who want to:

- develop and implement policy:

objects ... to be measured

-
- heal and be healthy:

subjects ... with living
experience



Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax)

What is evidence? What knowledge context?

Whose values determine this evidence?

- researchers: to “prove” is desirable; skepticism is a virtue
-
- Aboriginal community: to “know” is OK; trust is a gift



Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax) What is evidence? What knowledge context?

Who comes together to create “social”?

- Eurocentric: humans together

- Aboriginal: humans together with other sentient beings



Winds of Change, Roy Thomas artist

Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax)

What is evidence? What knowledge context?

What “life purpose” for this evidence?

- mainstream: to participate in an economy-based society
-
- traditional Aboriginal: to seek life ... spirituality central

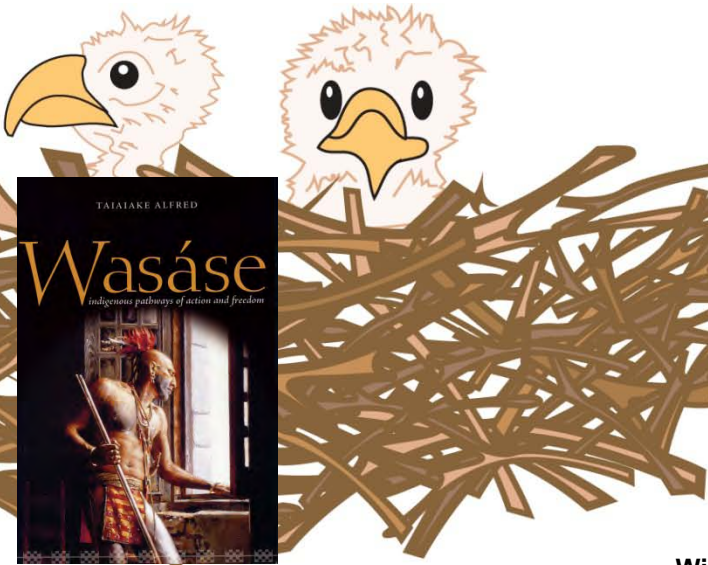


Winds of Change, Roy Thomas artist

Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax) What is evidence? What knowledge context?

What language for this evidence?

- economic model: **social capital; analytic philosophy**
-
- spirit-centric model: **compassion; Indigenous philosophy**



Winds of Change, Roy Thomas artist

Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax) What is evidence? What knowledge context?

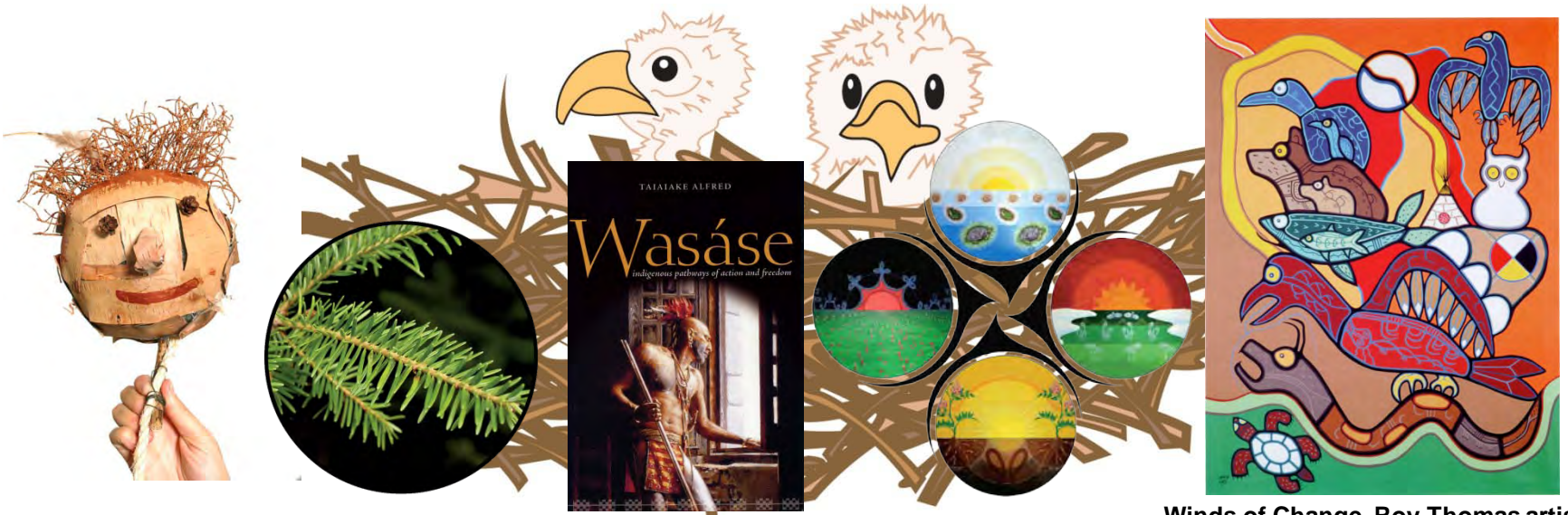
Evidence seen as ...

- abstract, noun-based indicators:

“quality of life”
... marginalize
those of difference

- consciousness-oriented, verb-based indicators:

meaning
making



Winds of Change, Roy Thomas artist

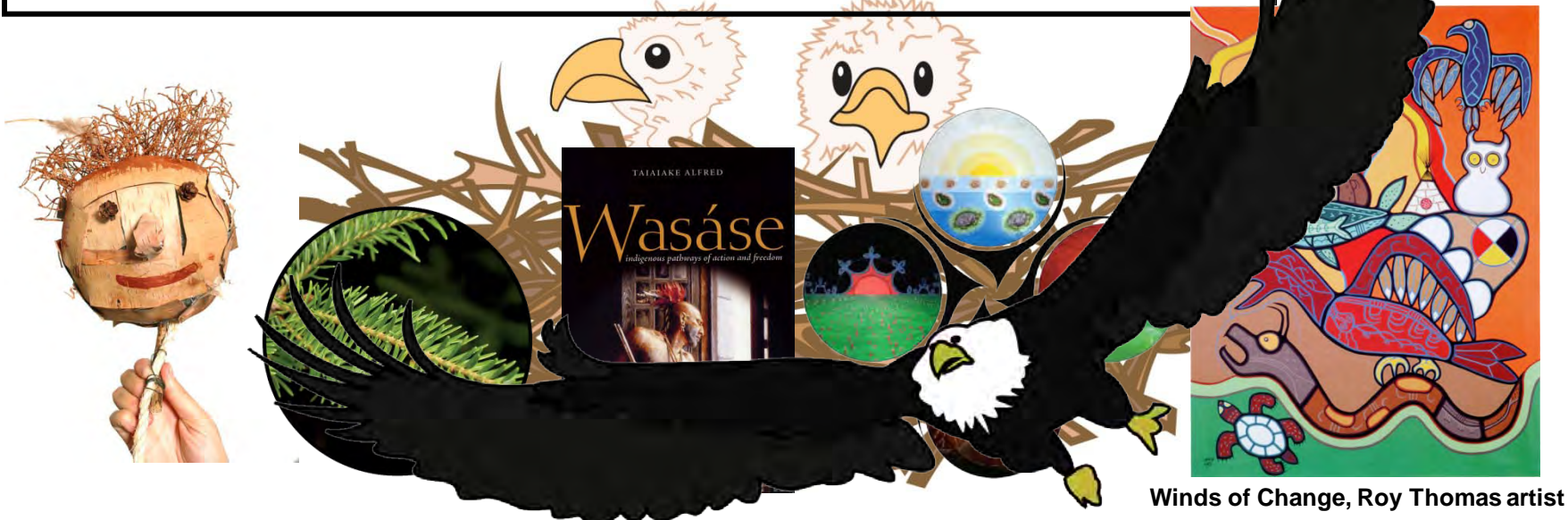
Social Determinants of Health: NCC-DH Think Tank (7 March 07, Halifax) What is evidence? What knowledge context?

Evidence within what consciousness:

- physical reality: **objects**

- physical + dream realities: **objects & subjects**

- physical + dream + unity realities: **!!!!!!!!!!!!!!**



Winds of Change, Roy Thomas artist

RESEARCH ... a Co-Learning Journey

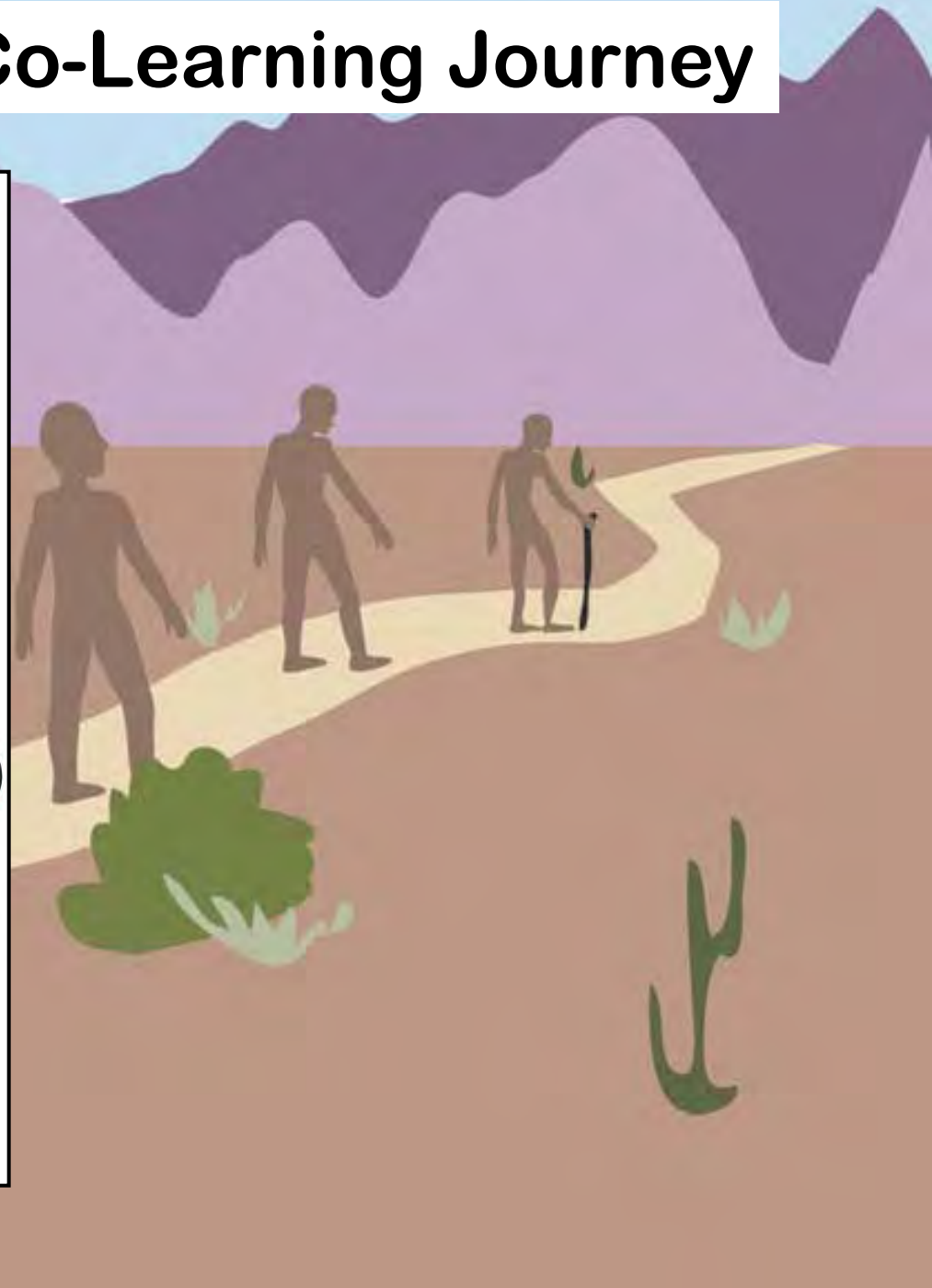
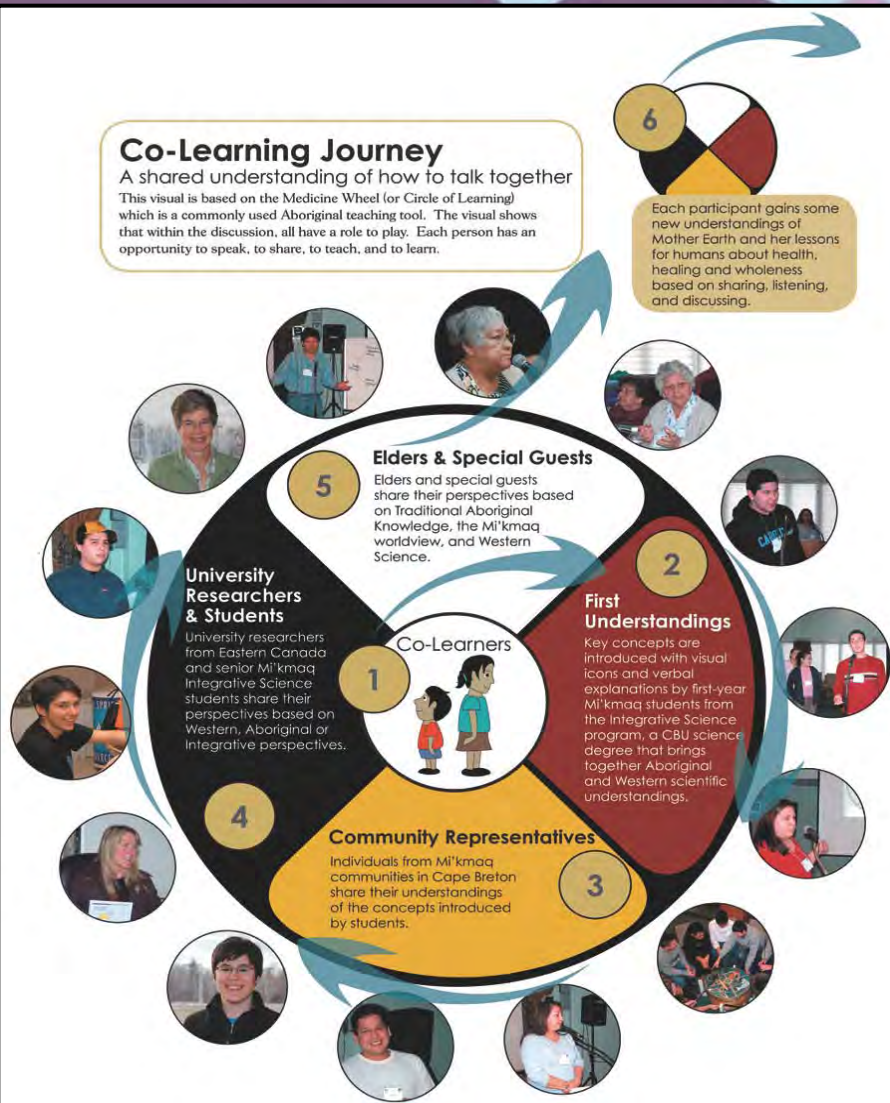
Co-Learning Journey

A shared understanding of how to talk together

This visual is based on the Medicine Wheel (or Circle of Learning) which is a commonly used Aboriginal teaching tool. The visual shows that within the discussion, all have a role to play. Each person has an opportunity to speak, to share, to teach, and to learn.



Each participant gains some new understandings of Mother Earth and her lessons for humans about health, healing and wholeness based on sharing, listening, and discussing.



Canada Research Chairs / Chaires de recherche du Canada / Canada

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Canada Foundation for Innovation / Fondation canadienne pour l'innovation

CAPE BRETON UNIVERSITY



CIHR IRSC / Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Mi'kmaq College Institute / Mi'kmaq Espi Kina'matno'kuom



IWK Health Centre Foundation

IAPH

ATLANTIC ABORIGINAL Health Research Program

Mi'kmaq Elders

NOVA SCOTIA Health Research FOUNDATION

SABLE OFFSHORE ENERGY INCORPORATED

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

KECCA Knowledge: Education and Cultural Consultant Associates

NSERC CRSNG

Mi'kmawey Debert

Eskasoni Detachment Royal Canadian Mounted Police / Gendarmerie royale du Canada