

CO-LEARNING re: “TALKING AND WALKING TOGETHER” OF INDIGENOUS AND MAINSTREAM SCIENCES

Albert Marshall¹ and Cheryl Bartlett²

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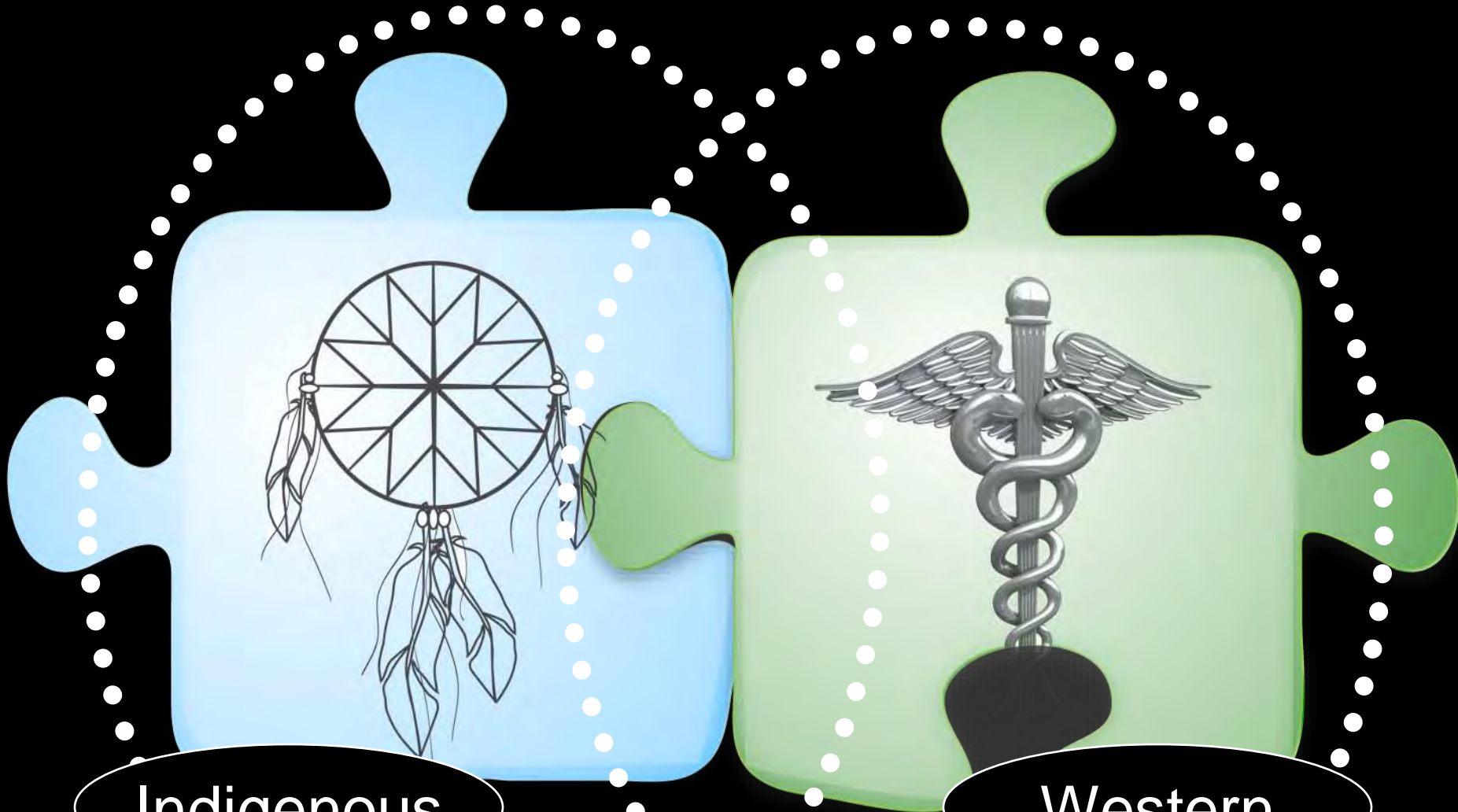


Knowledge, Education and Cultural Consultant Associates



CAPE BRETON
UNIVERSITY

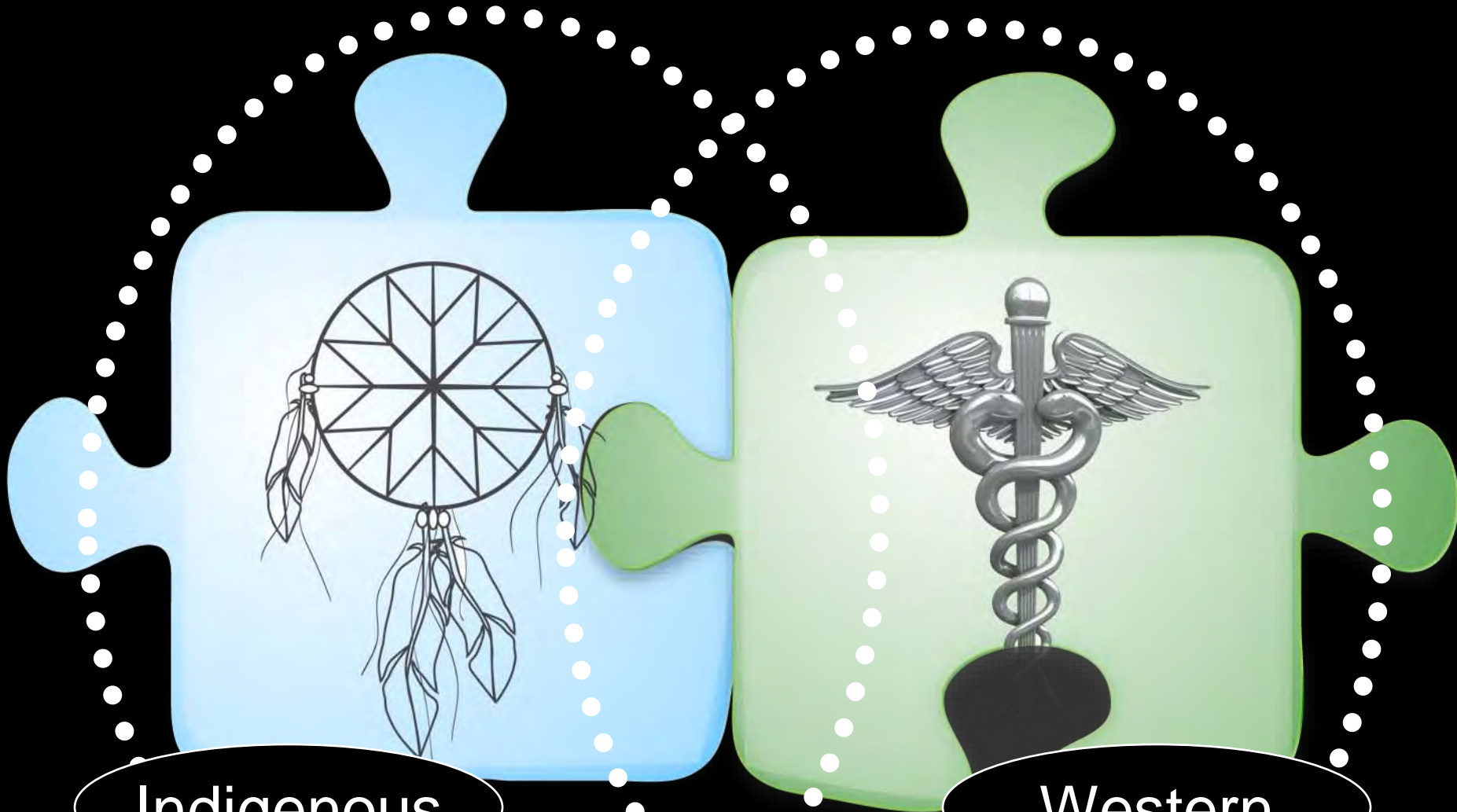
**Collaborative Environmental Planning Initiative (CEPI) for Bras d'Or Lake,
presentation for Steering Committee meeting of 19 February 2009,
Membertou First Nation, Nova Scotia**



Indigenous

Western

“bringing our sciences together”



Indigenous

Western

“bringing our knowledges together”

OUR KEY CONCEPTS and ACTIONS



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

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

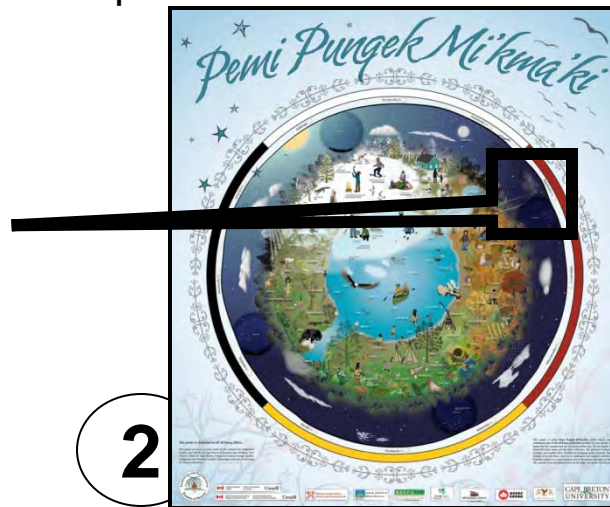
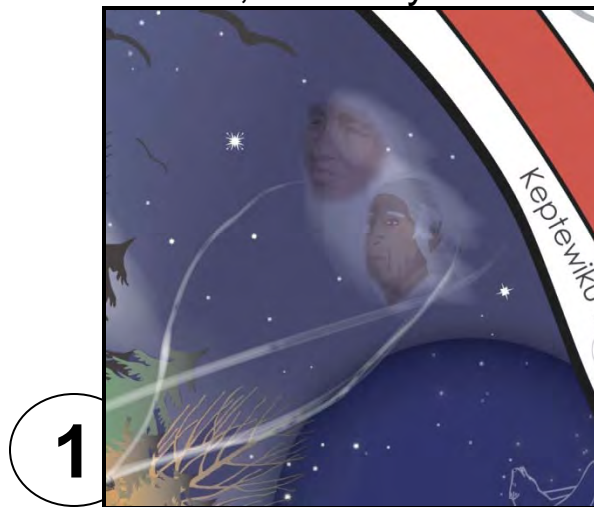
The breath of life versus the embodiment of life: Indigenous knowledge and western research

WIN-HEC Journal 2007 (World Indigenous Nations – Higher Education Consortium)

CINDY BLACKSTOCK

Executive Director, First Nations Child and Family Caring Society of Canada

Despite the diversity of Aboriginal cultures, there are several common fundamental differences between Aboriginal and western epistemologies. **1** Aboriginal peoples believe their ancestors were right on most things and western peoples: believe their ancestors were either mostly wrong or their ideas could be improved upon (Assembly of First Nations, 1993; Auger, 2001). **2** Aboriginal peoples believe they hold the land and life knowledge in a sacred trust for the generations to follow whereas many western peoples believe they can own land and knowledge and use it for individual benefit with little concern for future generations (RCAP, 1996; Pinto, in press), and **3** Aboriginal knowledge is situation within more expansive concepts of space and time (Auger, 2001). From these differences, flow very different concepts.



7

CO-LEARNING

"LESSONS LEARNED" over 15+ years

Elders, Mi'kmaq Nation

and other community

Knowledge Holders

together with university

Researchers and

Students

within various

Knowledge Applications and Workshops



LESSONS LEARNED

7

1. **ACKNOWLEDGE
WE NEED
EACH OTHER ...**
co-learning journey



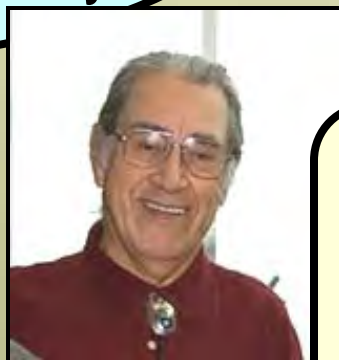
**Go into a forest, you see the birch, maple, pine.
Look underground and all those trees are holding
hands. We as people must do the same.
(late Mi'kmaq Chief, Spiritual Elder and Healer Charlie Labrador)**

LESSONS LEARNED

7

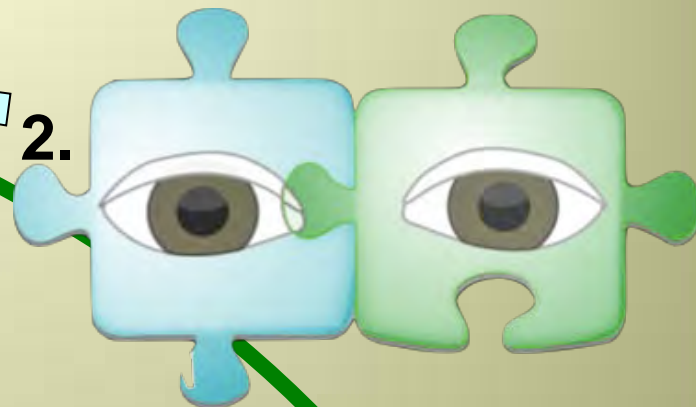
1.

**ACKNOWLEDGE
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co-learning journey**



Albert Marshall, Elder, Mi'kmaq Nation

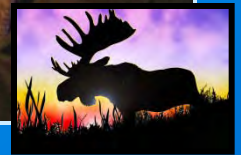
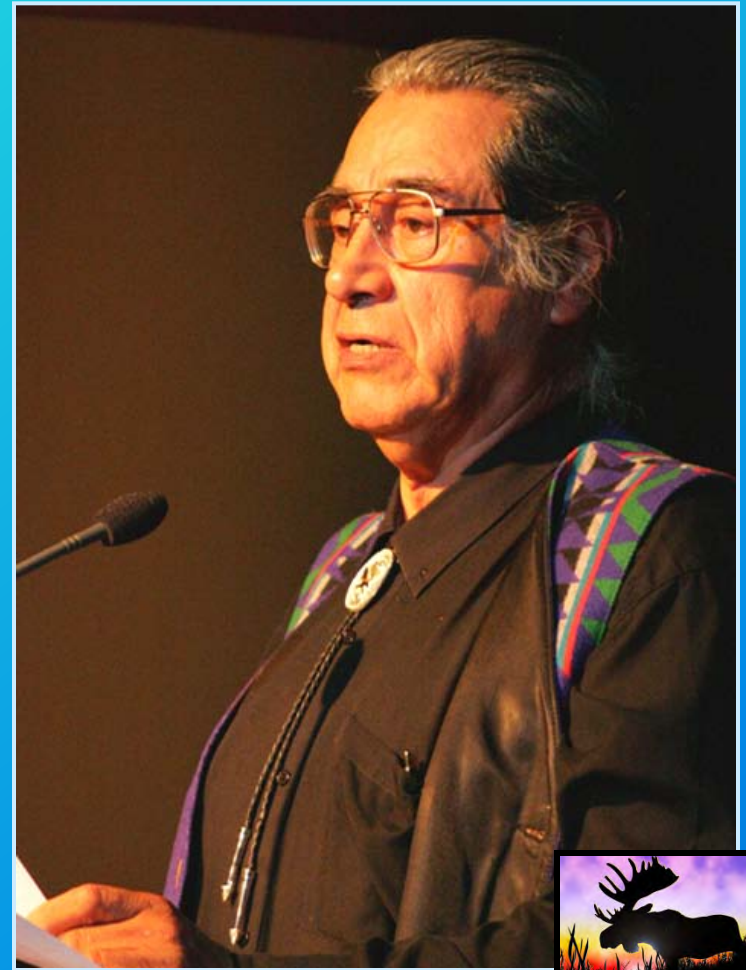
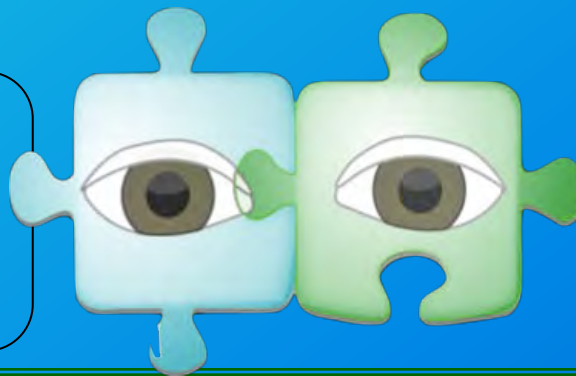
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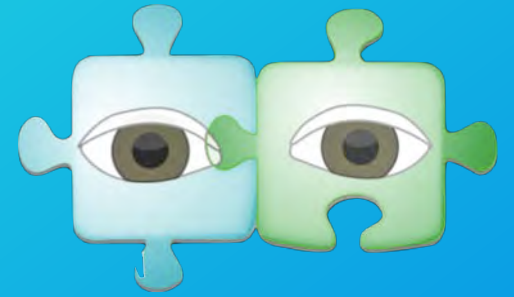
Two-Eyed Seeing
learning to see with the
strengths of each & together

“LEARN ... to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western (or Eurocentric or mainstream) knowledges and ways of knowing ... and to use both these eyes together, for the benefit of all.”

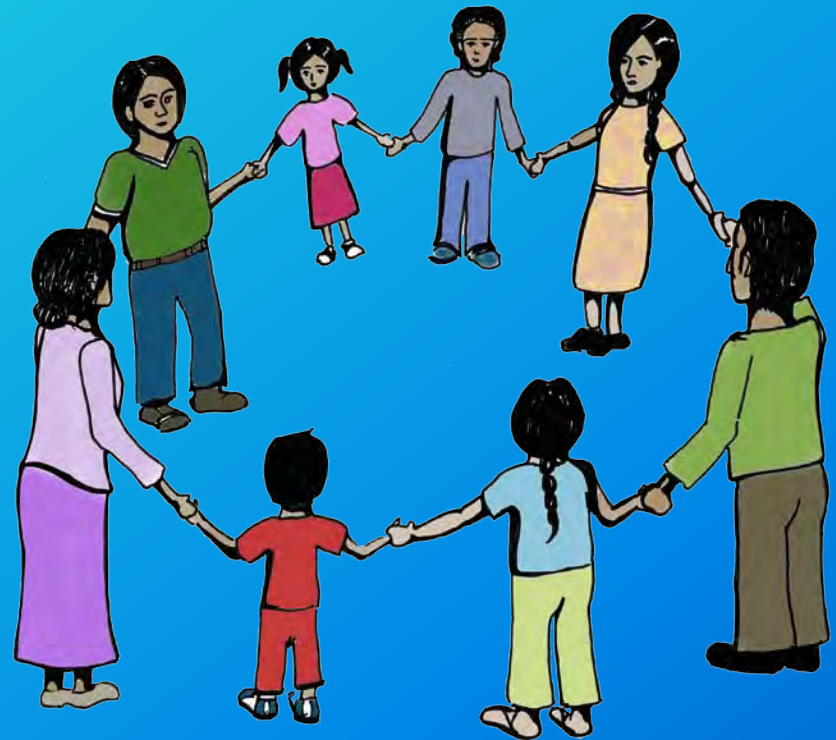
**TWO-EYED
SEEING**

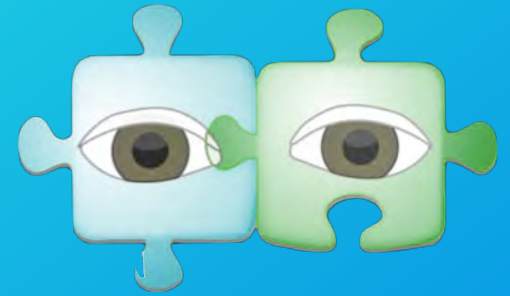


Elder Albert Marshall
Eskasoni community
Mi'kmaq Nation



**It is not
enough to go
through life
with one
perspective;
we must
embrace
all the tools
we have ...**





The Bras d'Or Lakes

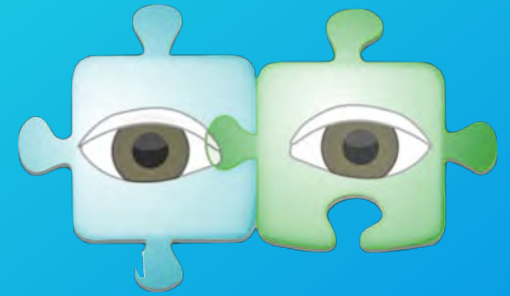
have been essential to the Mi'kmaq for thousands of years, for:

- sustenance
- spiritual education
- recreation



Mi'kmaq World View

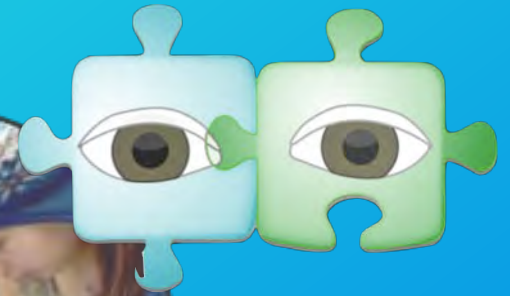
**Species possess rights.
Humans possess responsibilities.**



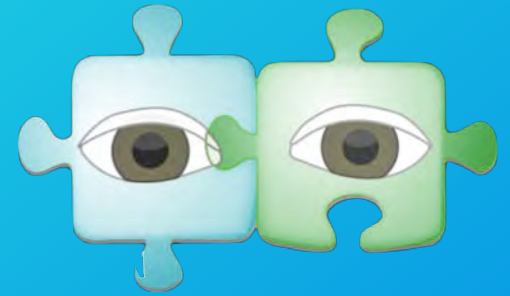
**Our culture is built
on long term vision
and our decisions
were made with
the next
Seven Generations
in mind.**



**We are equal to,
and part and parcel of,
the whole.**



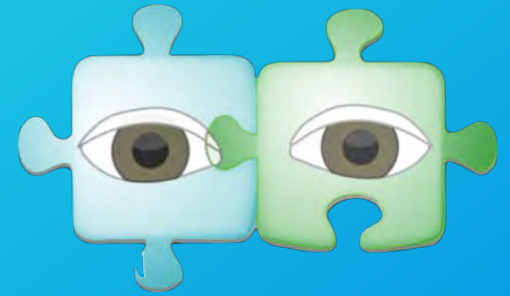
Our seasons follow the
cycles of **Mother Earth** ...



... so that our
children will
always be
reminded of the
beauty of
creation, and of
our dependence
on her.

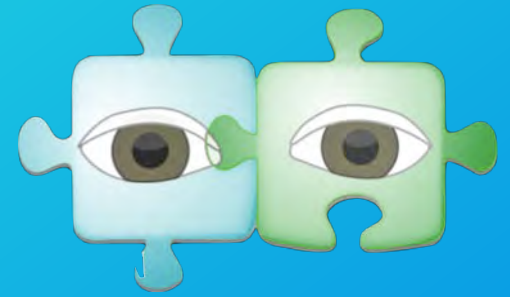
**Mother Earth
provides for us,
shelters us,
nourishes us.**

**Humans are not
privileged, rather
we are to be
responsible.**



from:
**Mi'kmaq Family
& Children's
Services**

**Everything that we do
to our natural world ...**



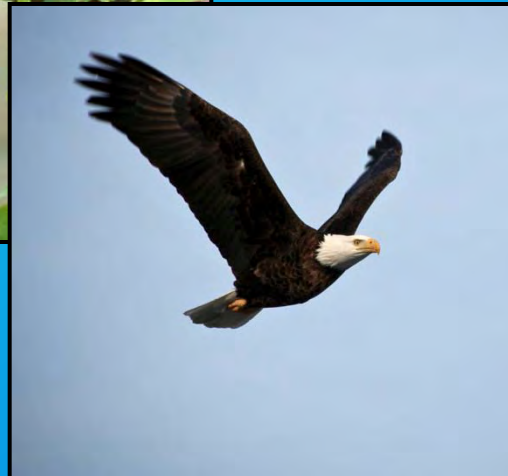
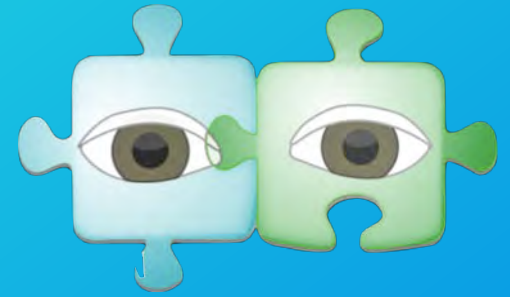
**... we also do to
ourselves**

**... since we are
all part and parcel
of the whole.**

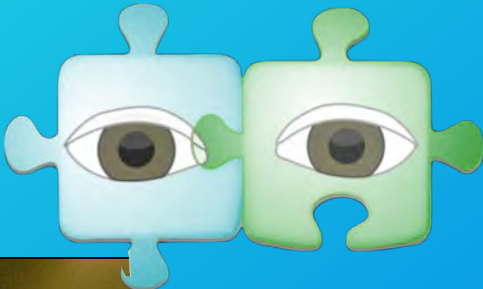


Netukulimk

developing the skills and sense of responsibility required to become a protector of other species



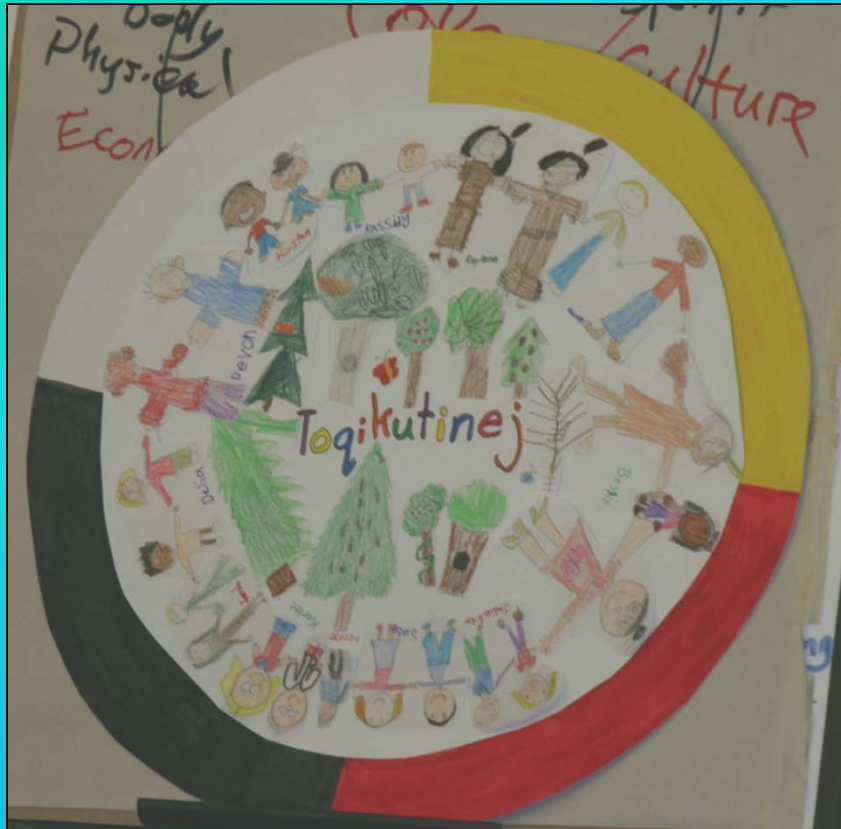
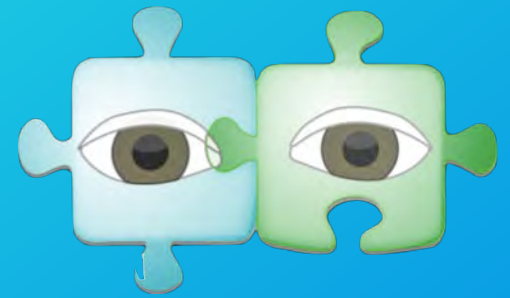
Ecosystem Audit



Water is the cradle of life.

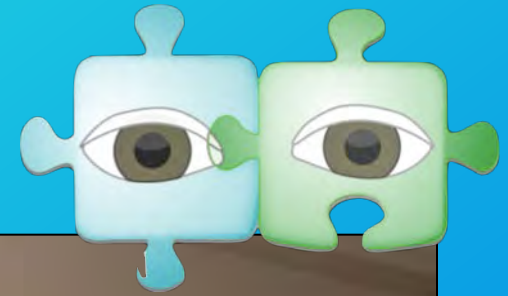


Life, Land, Language, Love



Artwork by children at
Eskasoni Elementary School

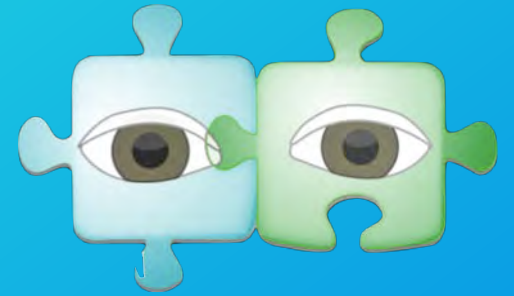
Like nature, we must always have a nurturing component.



**Knowledge is
spirit.**

**It is a Gift
passed on
through many
people.**

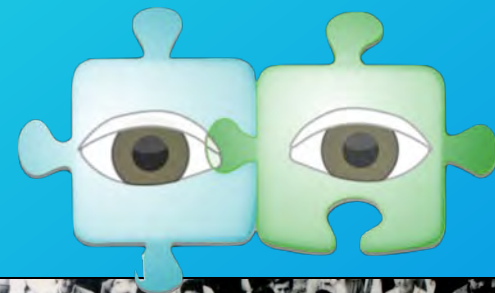
**We must pass it
on.**



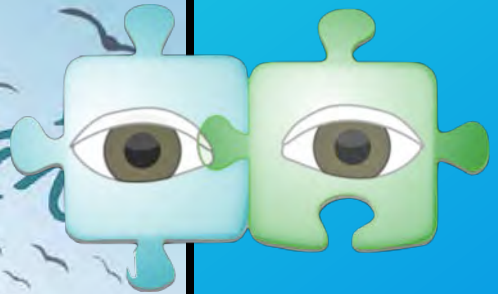
Artist: Basma Kavanagh

As Elders in Our Time

We seek to be a conduit for wisdom of our Ancestors. We seek to see with “Two-Eyes” ... to take the accomplishments of Western Science further by blending it with the wisdom of our Ancestors.



Pemi Pungek Mi'kmaq

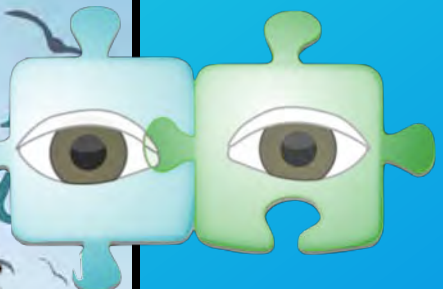


This poster is dedicated to all Mi'kmaq Elders.

This poster is one of a series made by the Institute for Indigenous Studies and Health at Cape Breton University and Mi'kmaq from National Elders of Cape Breton. Indigenous Elders bring together Indigenous and Western scientific knowledge and ways of knowing for mutual education.

This poster is called Pemi Pungek Mi'kmaq, which means one continuous year in the Mi'kmaq traditional territory. On the outside, it shows the four seasons and the 12 months of the year. On the inside, it shows the land, water, and sky and a full year. The pictures of plants, animals, and people show the cycle of changing seasons in nature. The pictures of people show what is the traditional and modern activities. Use this poster to learn the cycle of the seasons, Spring is on the left, summer is on the bottom, fall is on the right, and winter is on the top.

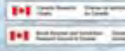




This poster is dedicated to all Mi'kmaq Elders.

This is a series made by the Institute for Sustainable Development at Cape Breton University and Mi'kmaq from Cape Breton. Indigenous leaders bring together their stories and traditions to create a vision of a sustainable future.

This poster is called Pami Dungek Mi'ka, which means 'our land, water, and sky' in Mi'kmaq. It shows the land, water, and sky and a full moon. It also shows the people of the Mi'kmaq and the importance of their traditions. The poster is a series of 12 posters that tell the story of the Mi'kmaq and their traditions.



CAPE BRETON UNIVERSITY



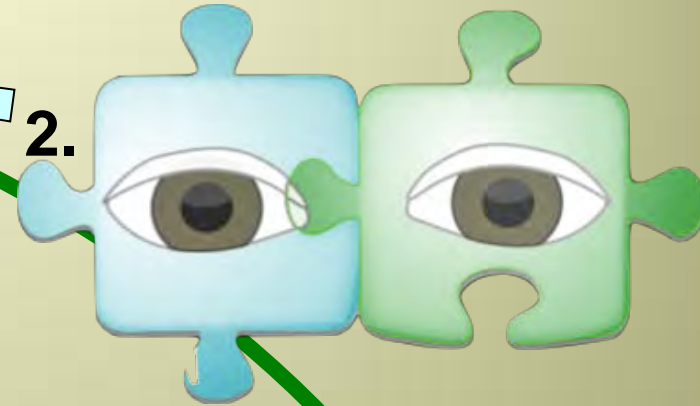
**Walking
and
Talking
Together**

LESSONS LEARNED

7

1. **ACKNOWLEDGE
WE NEED
EACH OTHER ...**
co-learning journey

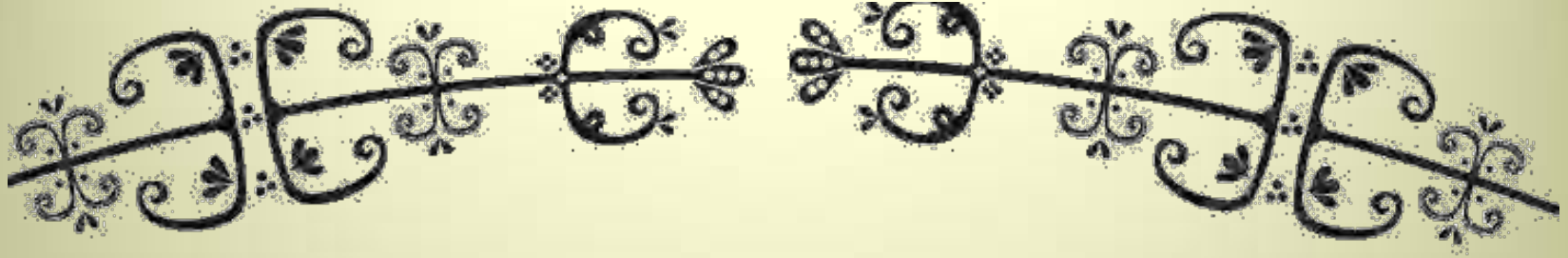
2.



3. view "SCIENCE"
inclusively

Science?





Indigenous and Western scientific knowledges are based in observations of the natural world.



“stories of our interactions with and within nature”

pattern smarts

Science is dynamic,
pattern-based knowledge.



Artist: Basma Kavanagh

stories of our interactions with and within nature

Science



pattern

- recognition
- transformation
- expression



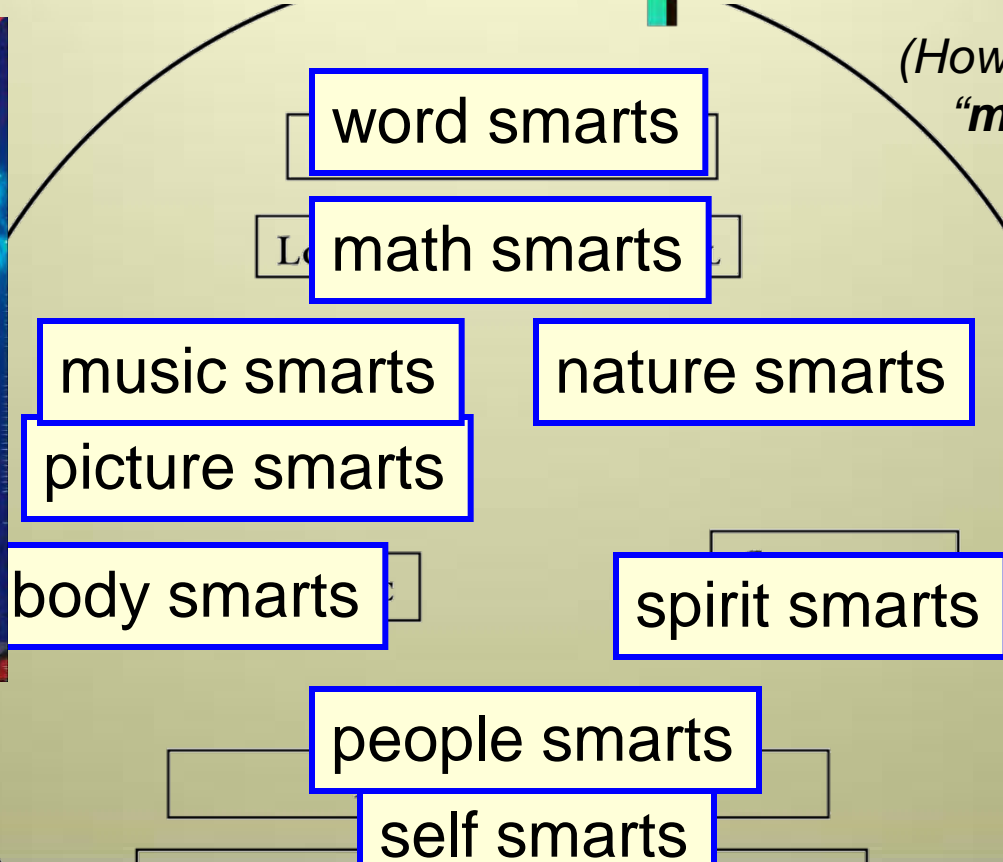
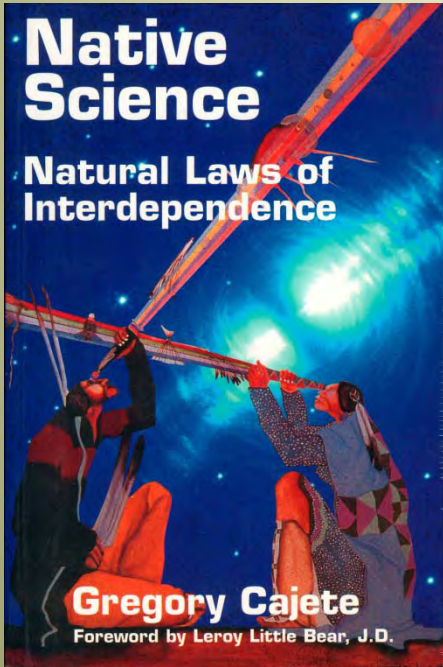
• pattern smarts

- various ways to connect the dots
- variety in our stories

stories of our interactions with and within nature

Science

stories draw upon **pattern smarts**



(Howard Gardner's
"multiple
intelligences" ...
a brain-based,
Western science
theory)



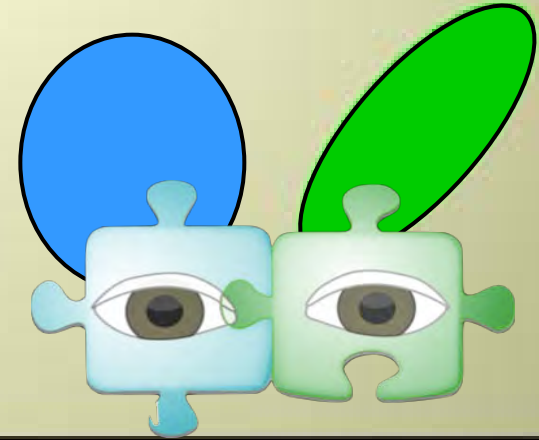
SANCTIONED PERSPECTIVES & INTELLIGENCES:
who we are; where we are; where we were;
what we know, do and value

stories of our interactions with and within nature

Science ... dynamic, pattern-based knowledge

PATTERNS ...

- spirits within **ecosystem-wide** minds
- ideas in **brain-based** minds

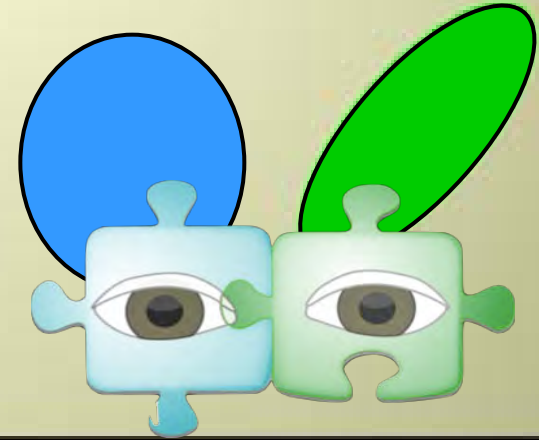


stories of our interactions with and within nature

Science ... dynamic, pattern-based knowledge

PATTERNS ...

- spirits within **ecosystem-wide** minds
- ideas in **brain-based** minds



cognitive neuroscience

sense of place, emergence, and participation
“know, do, value” (CEPI Workshop Oct 2004)



Murdena Marshall, Elder, Mi'kmaq Nation

Sheridan, J. & Longboat, D. 2006.

The Haudenosaunee imagination and the ecology of the sacred. *Space and Culture* 9(4): 365-81.

LESSONS LEARNED

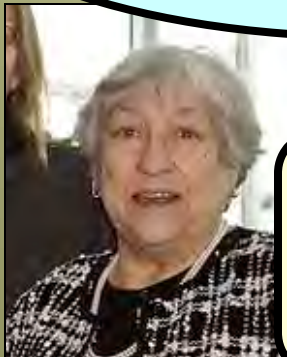
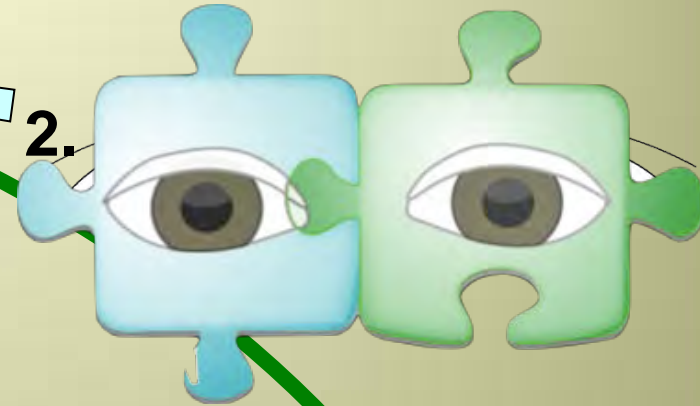
7

1. **ACKNOWLEDGE
WE NEED
EACH OTHER ...**
co-learning journey

4. **DO ... in a
CREATIVE, GROW
FORWARD WAY**

3. view "SCIENCE"
inclusively

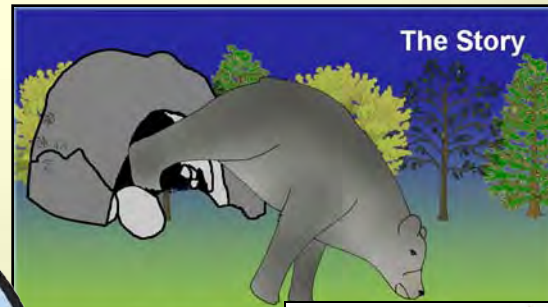
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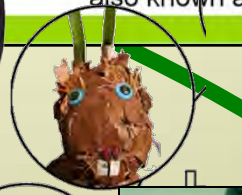
Murdena Marshall, Elder, Mi'kmaq Nation

Together We Heal & Grow
seeing & acknowledging my deeds

LESSONS LEARNED



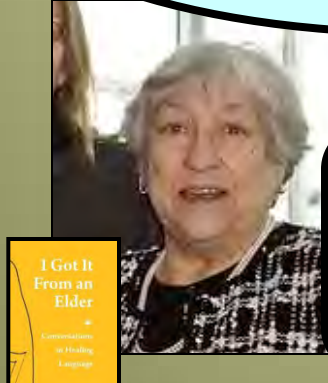
This is the s
also known a



DO ... in a
4. CREATIVE, GROW
FORWARD WAY



			<small>Eastern American Toad The Eastern American Toad (Bufo americanus) is a large, long-lived amphibian. It is found in a wide range of habitats, from wetlands to dry upland areas. It is known for its ability to survive in dry conditions by burrowing underground and estivating.</small>
			<small>Northern Spring Peeper - Pseudis cornuta The Northern Spring Peeper (Pseudis cornuta) is a small, brightly colored frog. It is found in wetlands and other aquatic habitats. It is known for its loud, peeping call.</small>
			<small>Northern Leopard Frog - Rana sylvatica The Northern Leopard Frog (Rana sylvatica) is a large, common frog. It is found in a wide range of habitats, from wetlands to dry upland areas. It is known for its distinctive leopard-spotted pattern.</small>
			<small>Wood Frog - Lithobates sylvaticus The Wood Frog (Lithobates sylvaticus) is a large, common frog. It is found in a wide range of habitats, from wetlands to dry upland areas. It is known for its ability to survive in dry conditions by burrowing underground and estivating.</small>



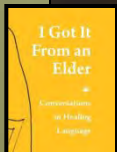
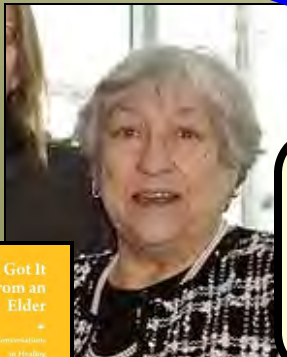
my

“See, in the Mi’kmaq world, in all Native worlds, you have to give recognition to everything: misdeeds, good deeds, past deeds, you know? Anything. You have to give that acknowledgement. Everything that you do, you have to acknowledge it.”

5. put our *values + actions*
+ *knowledges* in front of
us ... like an object

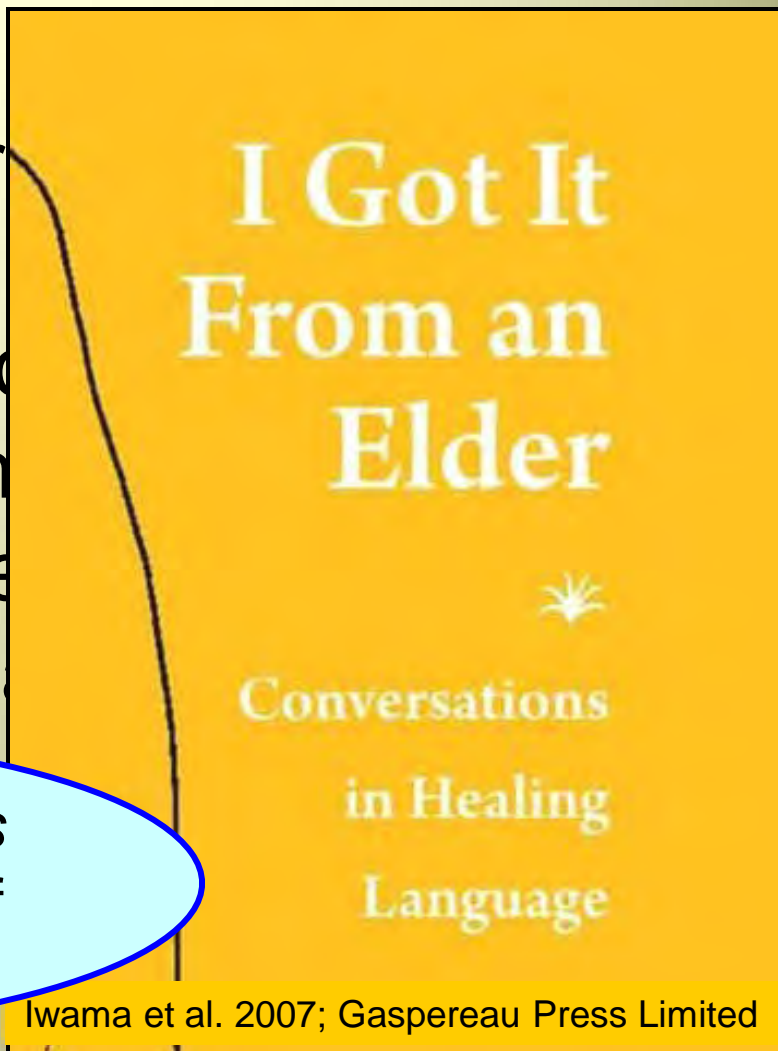
Murdena Marshall, Elder, Mi’kmaq Nation

Together We Heal & Grow
seeing & acknowledging my deeds



“See, in the Mi’kmaq world, you have to give everything: misdeeds, good deeds, you know? Anything you give that acknowledgement that you do, you have to

5. put our *values + actions + knowledges* in front of us ... like an object

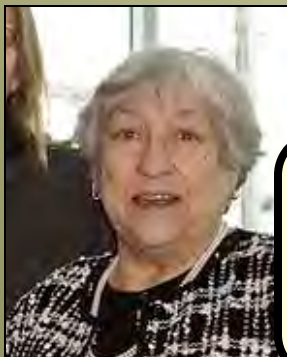
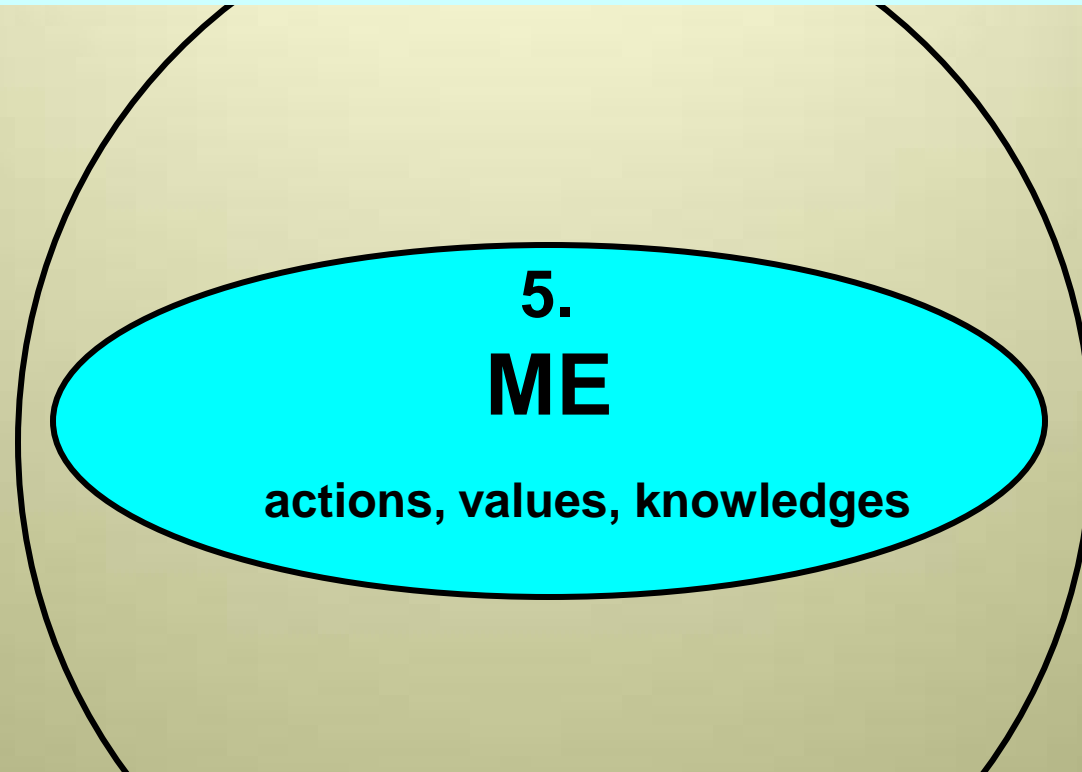


Murdena Marshall, Elder, Mi’kmaq Nation



Together We Heal & Grow
seeing & acknowledging my deeds

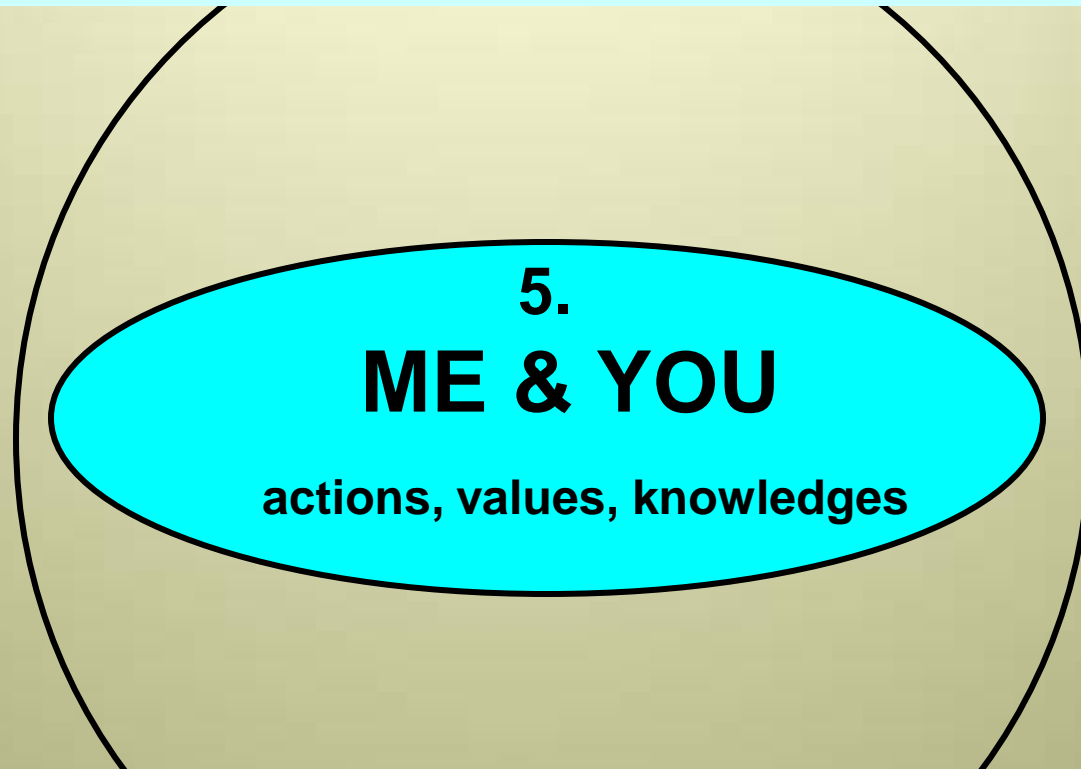
the “HEALING TENSE”



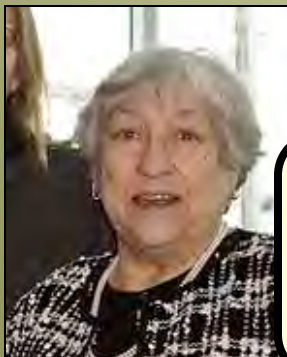
Murdena Marshall, Elder, Mi'kmaq Nation

Together We Heal & Grow
seeing & acknowledging my deeds

“together we heal & grow”



Murdena Marshall, Elder, Mi'kmaq Nation



Together We Heal & Grow
seeing & acknowledging my deeds

LESSONS LEARNED

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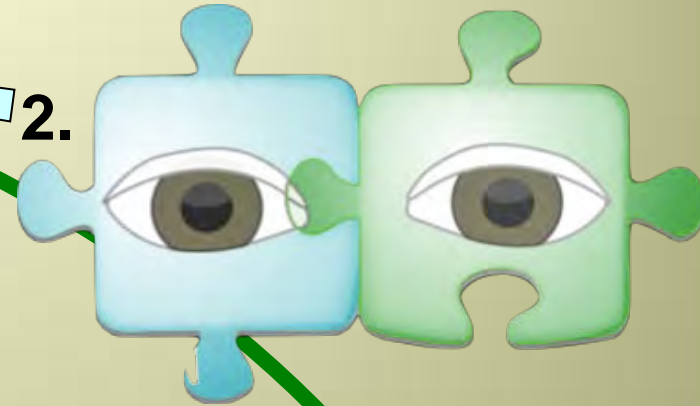
4. **DO ... in a
CREATIVE, GROW
FORWARD WAY**

3. view "SCIENCE"
inclusively

5. put our *actions + values*
+ knowledges in front of
us ... like an object

LANGUAGE

ME & YOU
actions, values, knowledges



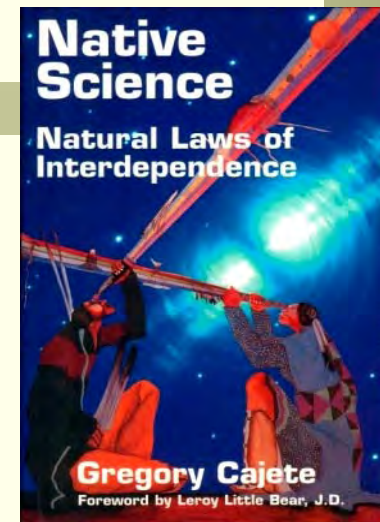
Being Nature's Mind: Indigenous Ways of Knowing and Planetary Consciousness

by Mary Jane Zimmerman, PhD.
ReVision 2004

Since 1999, I have participated in the Language of Spirituality dialogues between Native Americans, scientists, and linguists, which are held in Albuquerque, NM, every summer. During one such dialogue, a number of the Native American participants told long, winding stories, seemingly unconnected to the topic at hand. Finally, one of the Anglo physicists lost his composure and began criticizing the proceedings: "Let's get beyond just telling stories," he said, "and get down to a real discussion. Let's really get into it and sort out what is good and what is bad about Western science and Native science." What he had heard so far had not qualified for him as a "real discussion." The response, from the Native Americans present, was not the direct, confrontive type of argument that he was seeking, but instead, more stories, even more long and winding, which then elicited another outburst from the impatient physicist, who felt that his earlier plea had been ignored.

What was happening here? It was a failure of communication at the meta-level between people with different models of what constitutes proper social behavior and the correct way to get one's opinion across. The physicist, in being direct, critical, and confrontive, was breaking every rule of Native American social interaction. The Native Americans could not directly tell him that without also breaking their rules. Their way to show him that he was in the wrong and had something to learn was through indirect stories which he was expected to be able to "hear" and apply to himself. Their response of more stories, which to them was a highly refined, polite, and indeed, ethical response to his social insult, seemed to him to be insulting.

At the beginning of every Language of Spirituality dialogue, the moderator, Leroy Littlebear, tells us that in dialogue, we should set aside our tacit infrastructures, our currently held beliefs about reality, in order to listen deeply for whatever words, ideas, feelings, or perceptions surface in us during the experience. **However, as the above story illustrates, becoming aware of and setting aside one's tacit infrastructure is easier said than done.** [emphasis added]



Foreword, by
Leroy Littlebear

LESSONS LEARNED

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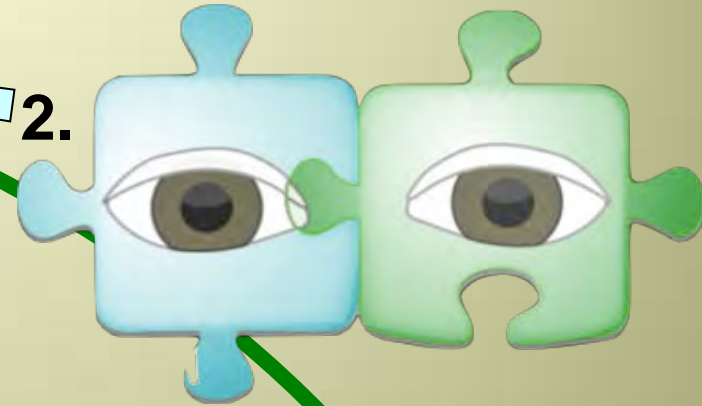
3. view "SCIENCE"
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knowledges in front of us
... like an object

LANGUAGE

ME & YOU

6. use **VISUALS**



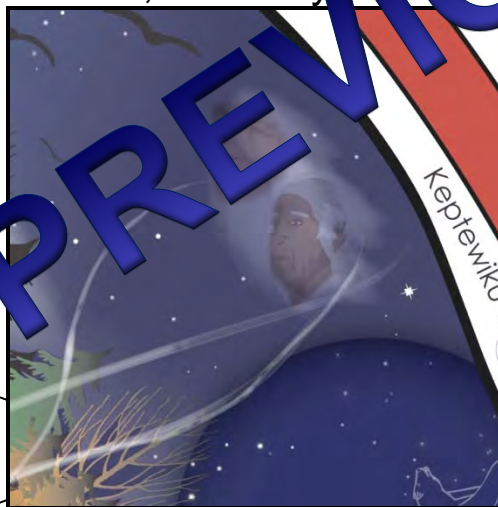
The breath of life versus the embodiment of life: Indigenous knowledge and western research

WIN-HEC Journal 2007 (World Indigenous Nations – Higher Education Consortium)

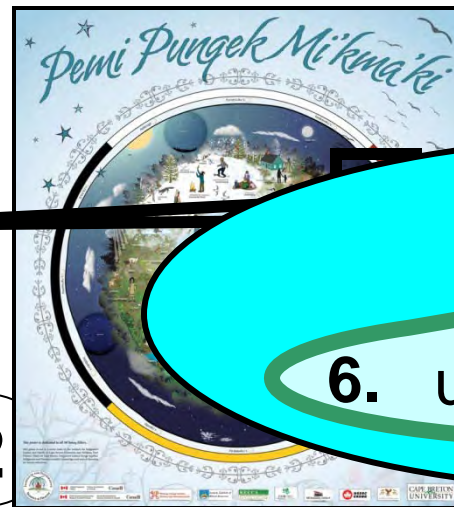
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Despite the diversity of Aboriginal cultures, there are several common fundamental differences between Aboriginal and western epistemologies. (1) Aboriginal peoples believe their ancestors were right on most things and western peoples believe their ancestors were either mostly wrong or their ideas could be improved upon (Assembly of First Nations, 1993; Auger, 2001), (2) Aboriginal peoples believe they hold the land and life knowledge in a sacred trust for the generations to follow whereas many western peoples believe they can own land and knowledge and use it for individual benefit with little concern for future generations (RCAP, 1996; Pines, in press), and (3) Aboriginal knowledge is situation within more expansive concepts of space and time (Auger, 2001). From these differences, flow very different concepts.



1

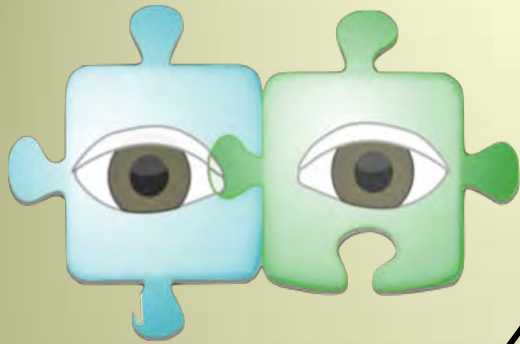


2



ME & YOU

6. use VISUALS



4 BIG QUESTIONS

Two-Eyed Seeing
learning to see with the strengths of each & together

OUR WORLDS

#1

ontologies

Two-Eyed Seeing
learning to see with the strengths of each & together

OUR KEY CONCEPTS and ACTIONS

#2

epistemologies

Two-Eyed Seeing
learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

methodologies

Two-Eyed Seeing
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

Life Love Land

vi

From: CCL Aboriginal Learning Knowledge Centre (www.cclcc.ca/CCL)

goals

5. put our *actions + values* knowledges in front of us ... like an object

ME & YOU

6. use VISUALS

LANGUAGE

LESSONS LEARNED

7

Two-Eyed Seeing
learning to see with the strengths of each & together

#1
OUR WORLDS

inter

Two-Eyed Seeing
learning to see with the strengths of each & together

#2
OUR KEY CONCEPTS and ACTIONS

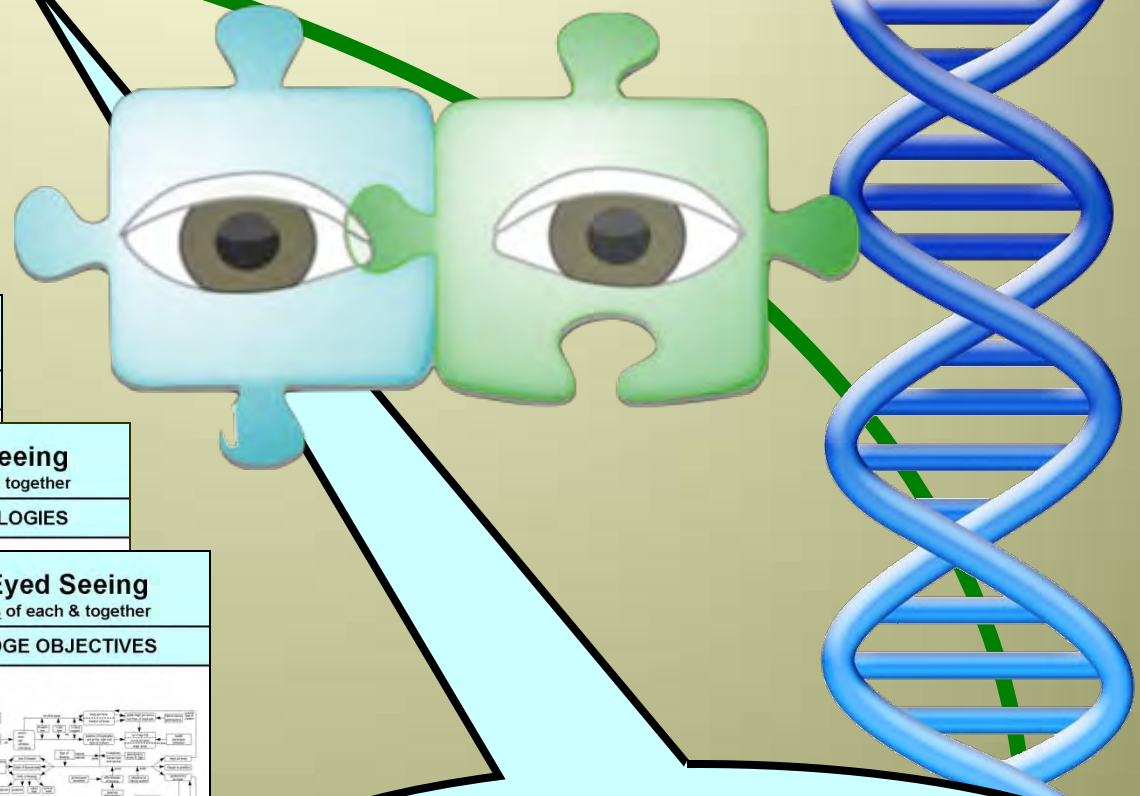
Two-Eyed Seeing
learning to see with the strengths of each & together

#3
OUR LANGUAGES and METHODOLOGIES

Two-Eyed Seeing
learning to see with the strengths of each & together

#4
OUR OVERALL KNOWLEDGE OBJECTIVES

from: CCL Aboriginal Learning Knowledge Centre (www.ccl.ca)
from: www.leads.ca

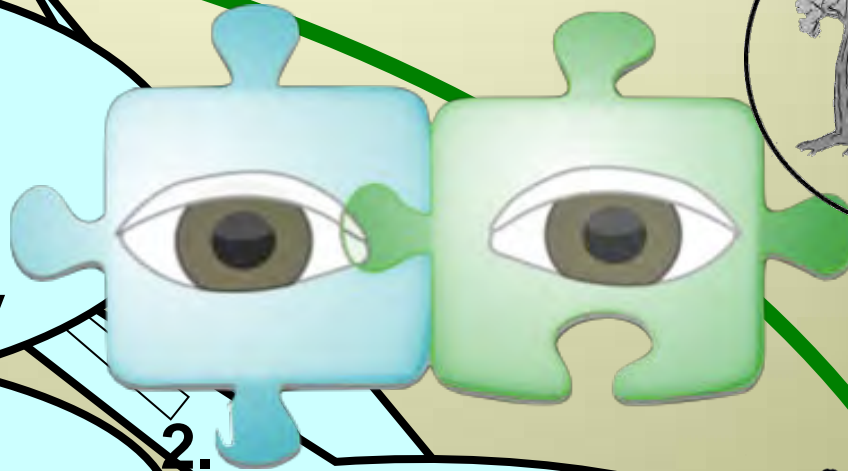


7. WEAVE
back and forth between
our worldviews

7 basic or fundamental LESSONS LEARNED

co-learning

1. **ACKNOWLEDGE
WE NEED
EACH OTHER ...**
co-learning journey



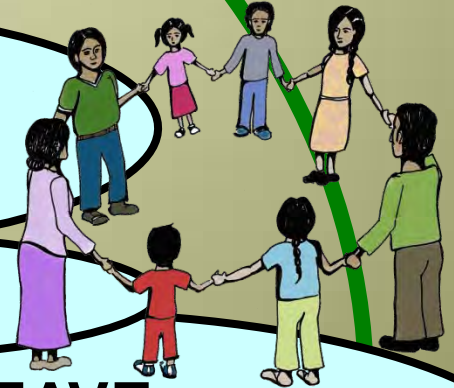
4. **DO ... in a
CREATIVE, GROW
FORWARD WAY**

2. **view "SCIENCE"
inclusively**

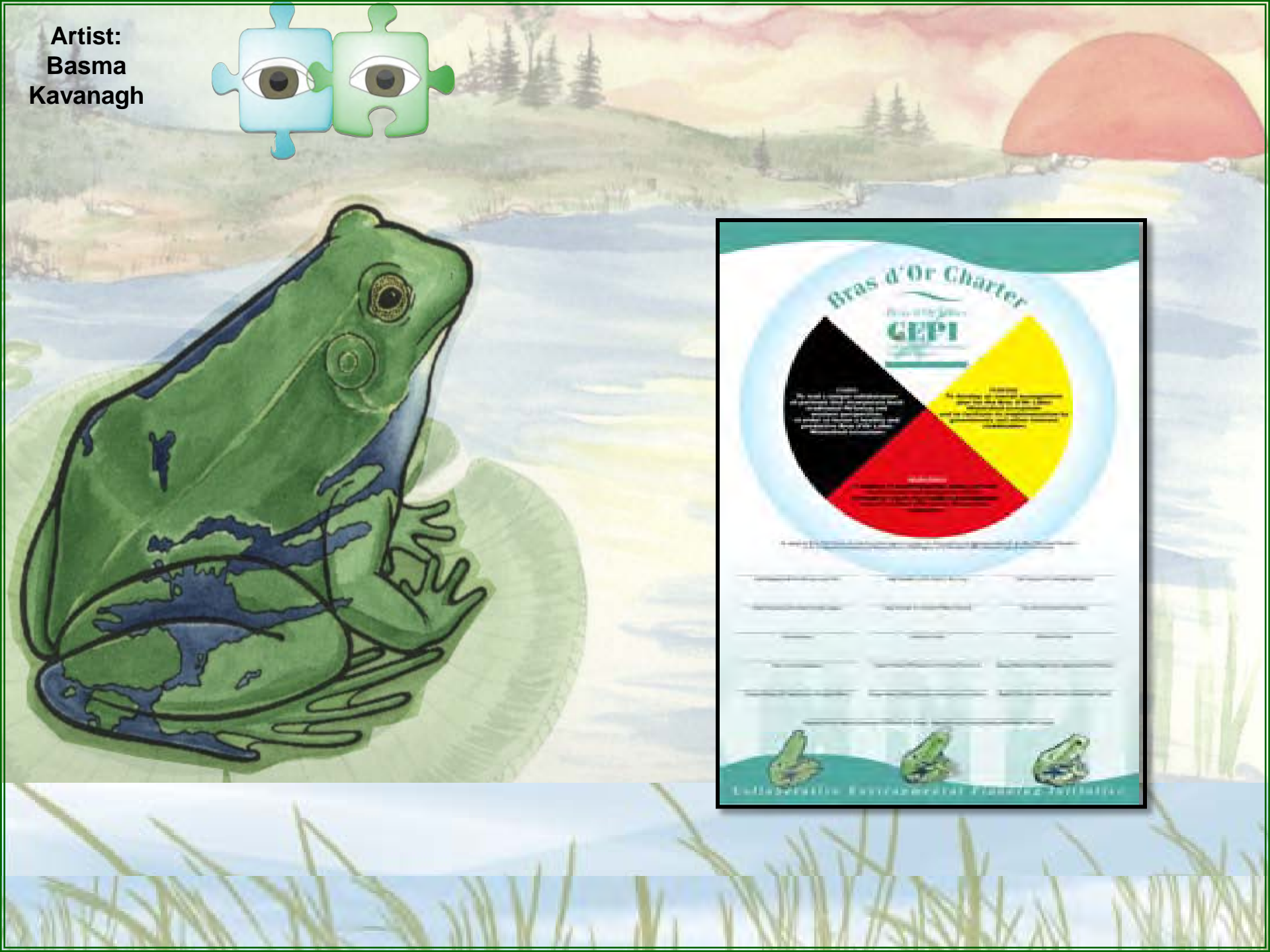
5. **put our *values + actions*
+ knowledges in front of
us ... like an object**

6. **use VISUALS**

7. **WEAVE**
back and forth between
our worldviews



Artist:
Basma
Kavanagh



Bras d'Or Charter
Initiative
CEPI

Black Section:
The main objective of this charter is to ensure that the environmental management of the CEPI is carried out in a responsible and transparent manner. It is intended to be a living document that will be updated as the CEPI evolves.

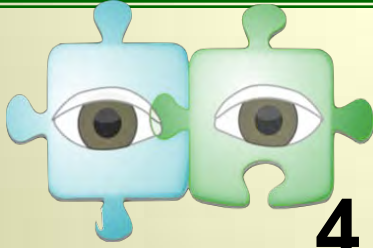
Yellow Section:
The CEPI is committed to the highest standards of environmental performance. It will ensure that its activities are carried out in a way that minimizes its impact on the environment and maximizes its contribution to the community.

Red Section:
The CEPI will ensure that its activities are carried out in a way that is consistent with the principles of sustainable development. It will ensure that its activities are carried out in a way that is socially responsible and that it contributes to the well-being of the community.

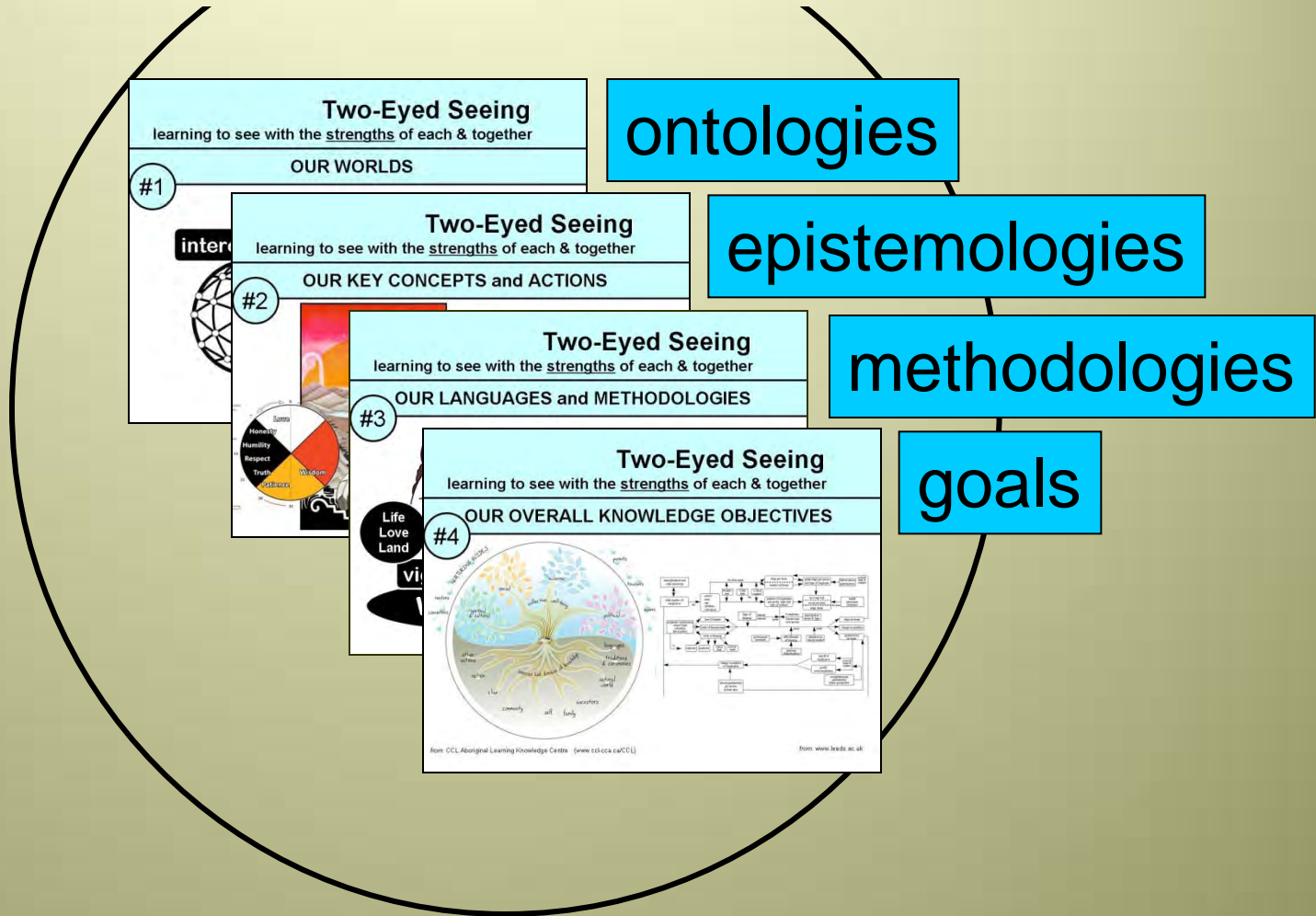
White Section:
The CEPI will ensure that its activities are carried out in a way that is transparent and accountable. It will ensure that its activities are carried out in a way that is consistent with the principles of good governance.

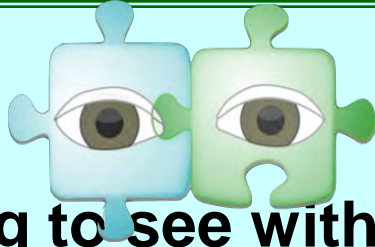
Signature: _____
Date: _____

Collaborative Environmental Funding Initiative



4 BIG QUESTIONS





Two-Eyed Seeing

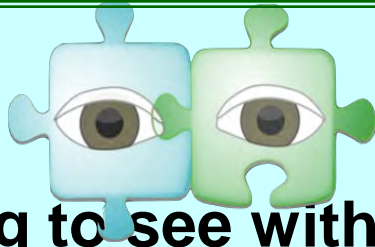
learning to see with the strengths of each & together

OUR WORLDS

#1

BIG QUESTION

**What do we believe
the world or cosmos to be?
(ontology)**



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR WORLDS

#1

BIG UNDERSTANDING ... IN WORDS

interconnective

beings ...
interconnective
and animate:

*spirit +
energy + matter*

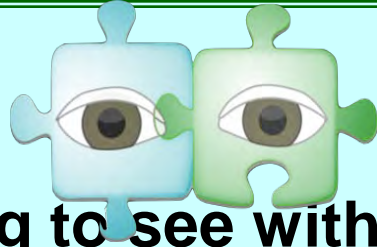
with
CONSTANT CHANGE
within balance and wholeness

parts & wholes

objects ...
comprised of parts and
wholes characterized by
systems and emergences:

energy + matter

with
EVOLUTION



Two-Eyed Seeing

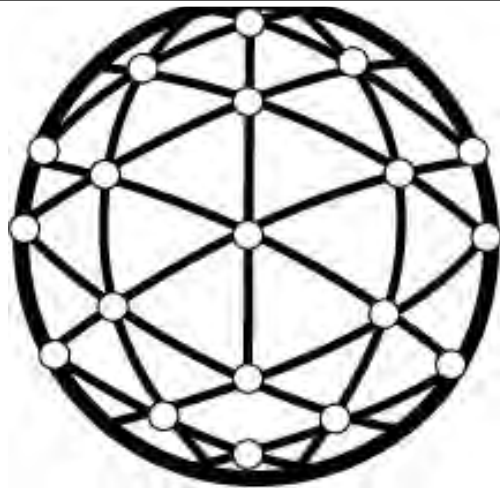
learning to see with the strengths of each & together

OUR WORLDS

#1

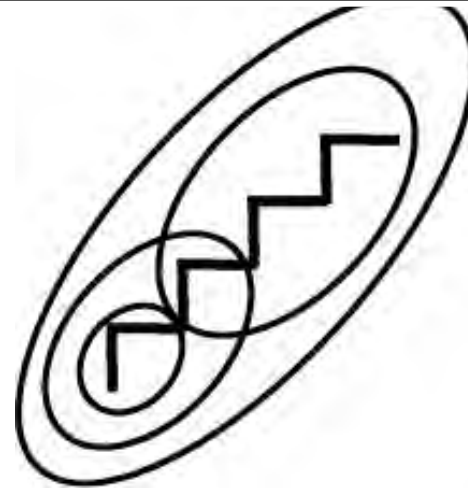
BIG UNDERSTANDING ... IN VISUALS

interconnective

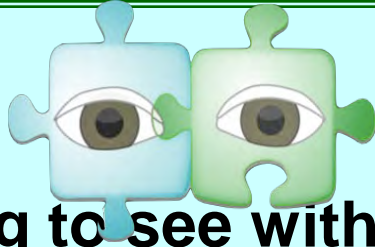


CONSTANT CHANGE
within balance and wholeness

parts & wholes



EVOLUTION



Two-Eyed Seeing

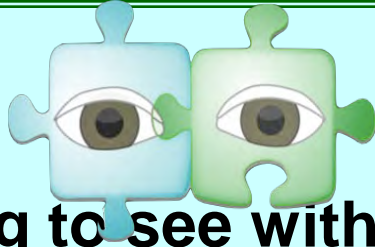
learning to see with the strengths of each & together

OUR KEY CONCEPTS and ACTIONS

#2

BIG QUESTION

**What do we value as
“ways of coming to know”
the cosmos?
(epistemology)**



Two-Eyed Seeing

learning to see with the strengths of each & together

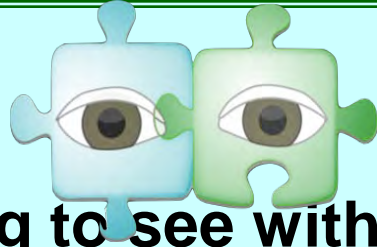
OUR KEY CONCEPTS and ACTIONS

#2

BIG UNDERSTANDING ... IN WORDS

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

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



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR KEY CONCEPTS and ACTIONS

#2

BIG UNDERSTANDING ... IN VISUALS

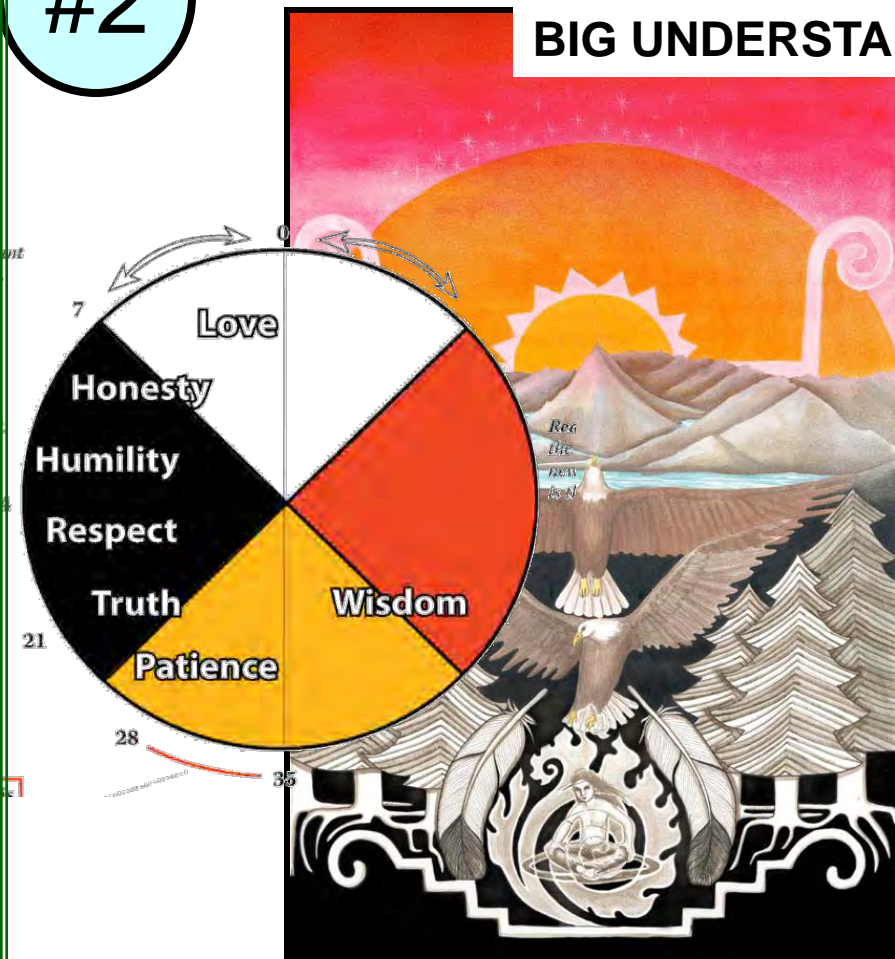
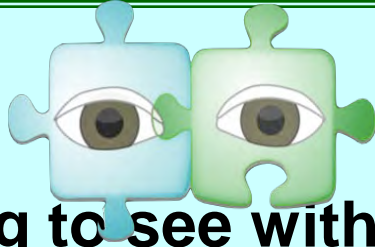


photo credit: NRC



Two-Eyed Seeing

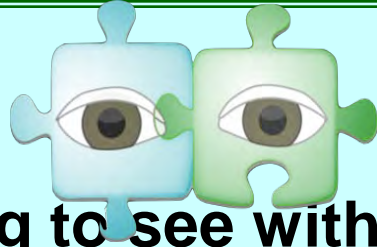
learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

BIG QUESTION

**What can remind us
of the complexity within
our ways of knowing?**



Two-Eyed Seeing

learning to see with the strengths of each & together

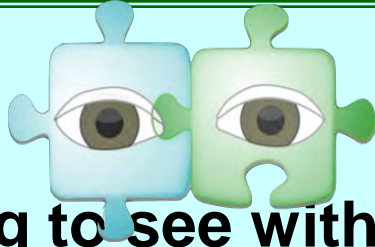
OUR LANGUAGES and METHODOLOGIES

#3

BIG UNDERSTANDING ... IN WORDS

weaving of patterns within nature's patterns via creative relationships and reciprocities among ***love, land, and life (vigour)*** that are constantly reinforced and nourished by Aboriginal languages

un-weaving of nature's patterns (especially via analytic logic and the use of instruments) to cognitively reconstruct them, especially using ***mathematical language (rigour)*** and computer models



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

BIG UNDERSTANDING ... IN WORDS

Life
Love
Land

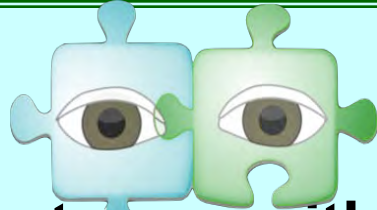
vigour

WEAVING

Math
&
Instruments

rigour

UN-WEAVING



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

BIG UNDERSTANDING ... IN VISUALS



Life
Love
Land

vigour

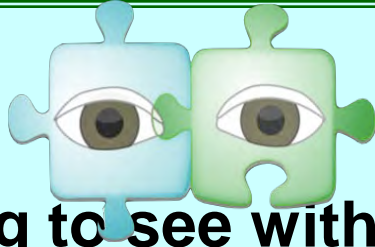
WEAVING



Math
&
Instruments

rigour

UN-WEAVING



Two-Eyed Seeing

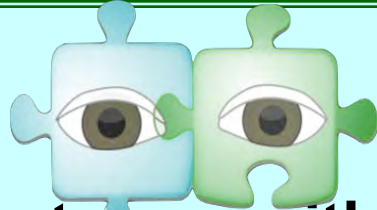
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

BIG QUESTION

**What overall goals
do we have for
our ways of knowing?**



Two-Eyed Seeing

learning to see with the strengths of each & together

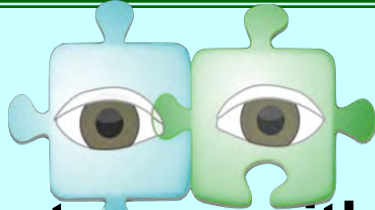
OUR OVERALL KNOWLEDGE OBJECTIVES

#4

BIG UNDERSTANDING ... IN WORDS

collective, living
knowledge to enable
nourishment of one's journey
within expanding sense of
"place, emergence and
participation" for tribal
consciousness and
interconnectiveness

dynamic, testable,
published knowledge
independent of
personal experience
that can enable
prediction and control
(and "progress")



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

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“place, emergence and
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consciousness and
interconnectiveness

dynamic, testable,
published knowledge
independent of
personal experience
that can enable
prediction and control
(and “progress”)

**towards resonance of
understanding within environment**

**towards construction of
understanding of environment**



Wela'liog

Thank you



Canada Research
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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



Mi'kmawey Debert



Membertou
Elementary

IAPH



Thank you / Wela'liog

CIHR IRSC

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Health Research Instituts de recherche
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IWK Health Centre
Foundation



Mermaid Theatre
of Nova Scotia



Eskasoni First Nation Detachment
Royal Canadian Mounted Police Gendarmerie royale
du Canada



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

**The support of various
partners and funding agencies
is gratefully acknowledged.**