

3-8 August 2008

*Annual International Conference*

2008

Wildlife Disease Association  
Edmonton



# **FACILITATING THE “TALKING AND WALKING TOGETHER” OF INDIGENOUS AND MAINSTREAM SCIENCES**

\*Cheryl Bartlett<sup>1</sup>, Albert Marshall<sup>2</sup>, Murdena Marshall<sup>2</sup>

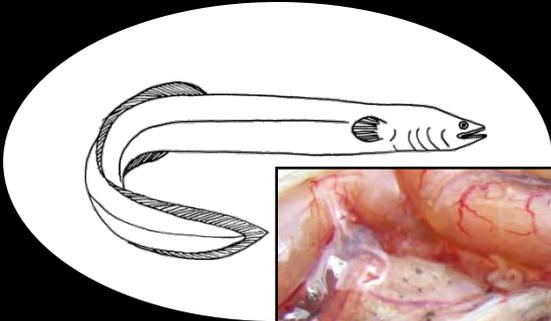
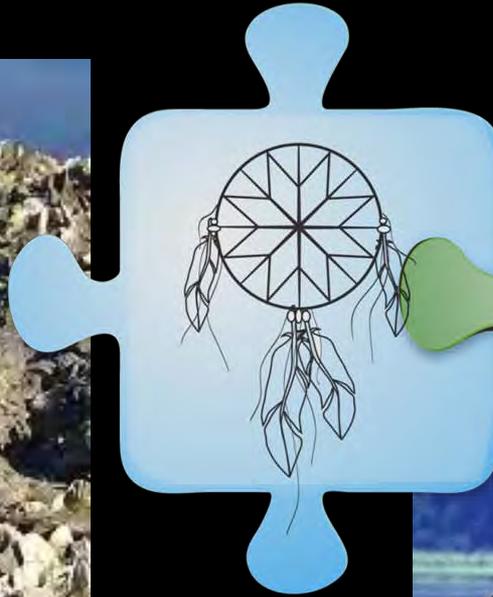
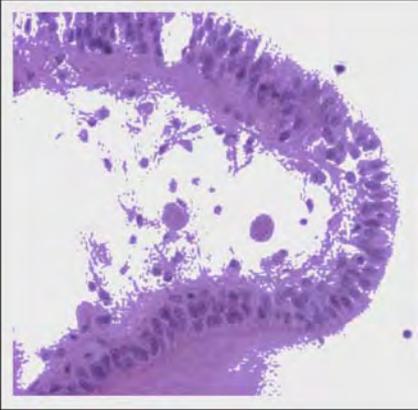
<sup>1</sup>Cape Breton University, Sydney, NS, Canada

<sup>2</sup>Eskasoni Mi'kmaq First Nation, NS, Canada

CAPE BRETON  
UNIVERSITY

## **ABSTRACT for C. BARTLETT, A. MARSHALL, AND M. MARSHALL:**

Mainstream-trained research scientists and others in government, universities, consulting agencies, and elsewhere increasingly find themselves as participants in ecosystem or wildlife health initiatives wherein there is a desire to include Aboriginal communities and traditional knowledge. An inherent challenge (which may or may not be acknowledged, recognized, or faced) within this desire is: how do mainstream and Indigenous knowledges talk to, and walk with, each other? Insights that can help address this challenge can be drawn from the “Integrative Science” (IS) initiative in Cape Breton, Nova Scotia. The initiative, now in its 15th year, involves university scientists and Mi’kmaq First Nations’ Elders, plus a few other key individuals and community organizations (community-based, participatory action research methodologies are used). The IS vision from the outset was to bring together Indigenous and mainstream scientific knowledges and ways of knowing. The initial arena was post-secondary science education but IS rapidly expanded into the arenas of science research, applications, and outreach to Aboriginal youth and community. Insights from IS that can help facilitate the “talking and walking together” of Indigenous and mainstream sciences include various lessons learned, a broadened view of science, and a few “big picture” science knowledge visuals. Significance of the latter reside with the intent that participants in IS efforts be able to weave back and forth between Indigenous and mainstream sciences (as circumstances may dictate) rather than attempting to merge the two and also while trying to avoid knowledge domination, assimilation, or marginalization.



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# Integrative Science



Indigenous



Western

“bringing our knowledges together”

# Integrative Science



Indigenous

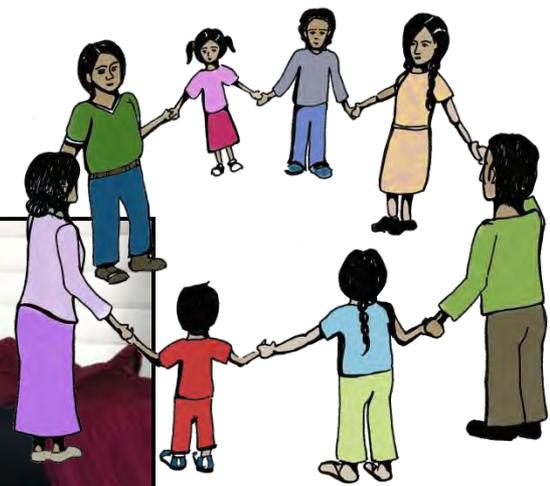


Western

“bringing our sciences together”

# SEVEN LESSONS LEARNED

over 15+ years



# SEVEN LESSONS LEARNED

#1

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



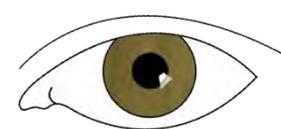
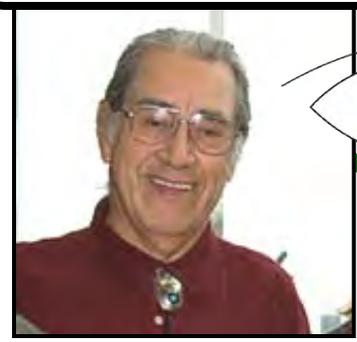
# SEVEN LESSONS LEARNED

#1

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

#2

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

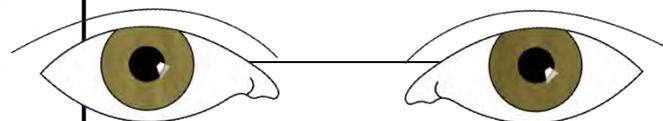
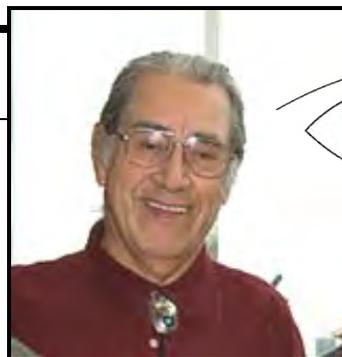


**Albert Marshall, Elder, Mi'kmaq Nation**

# SEVEN LESSONS LEARNED

#2

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



Albert Marshall, Elder, Mi'kmaq Nation

“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 LEARN to use both these eyes together, for the benefit of all.”

# SEVEN LESSONS LEARNED

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

#1

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

#2



view "SCIENCE"  
inclusively

#3

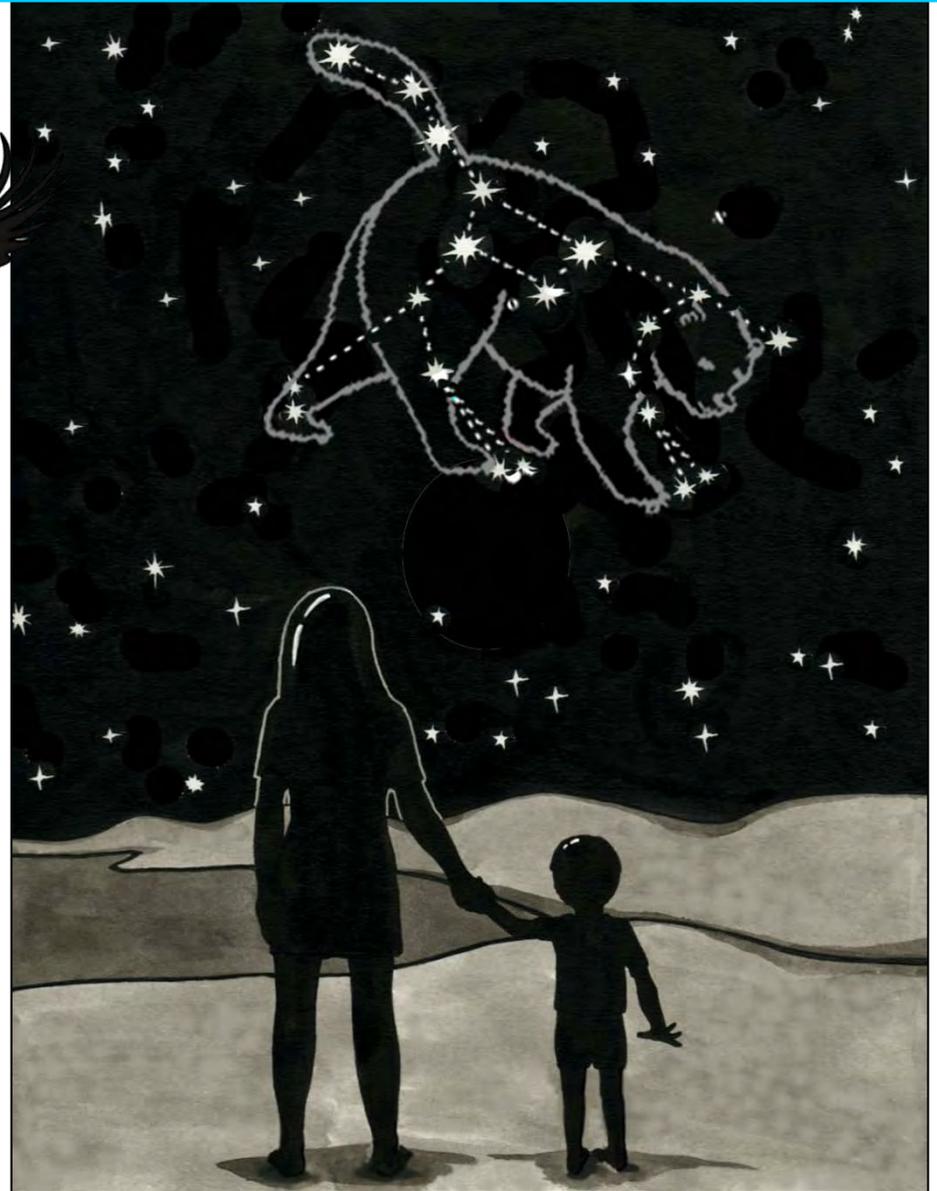
**Science?**



# stories of our interactions with and within nature

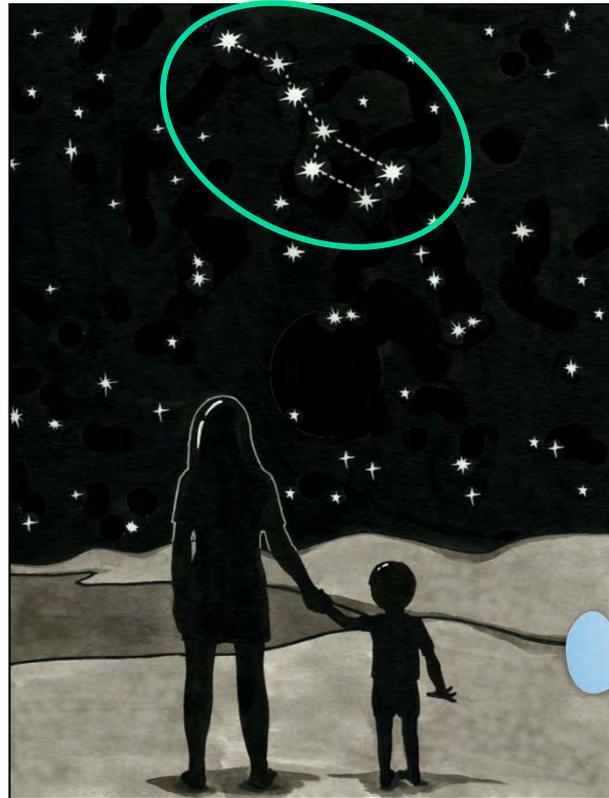
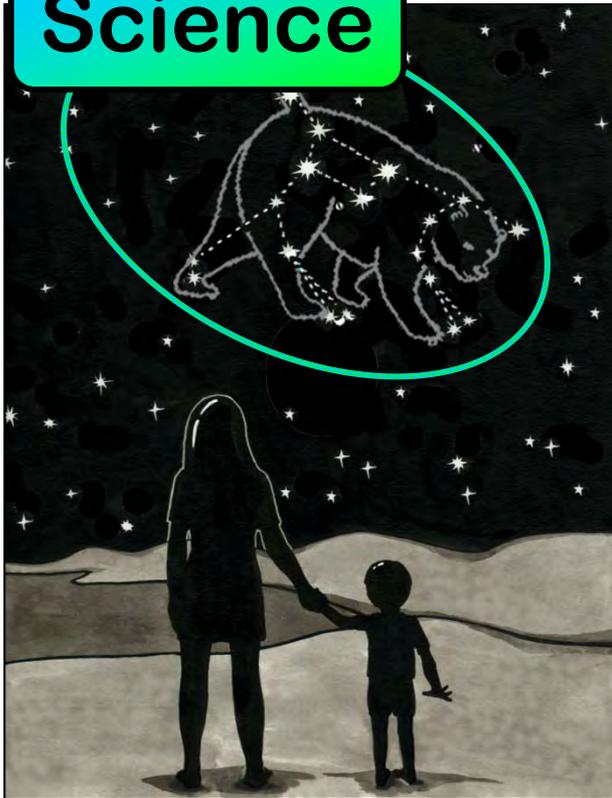


Science is  
dynamic,  
**pattern-based**  
knowledge.



# stories of our interactions with and within nature

## Science



## pattern

- recognition
- transformation
- expression



- various **pattern smarts**
- various ways to connect the dots
- variety in our stories

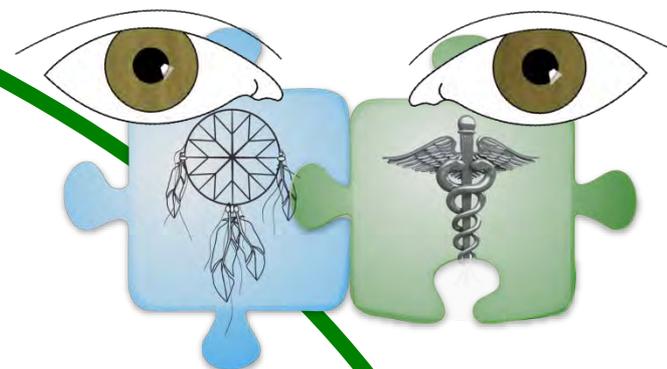
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**ACKNOWLEDGE  
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co-learning journey

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**Two-Eyed Seeing**  
learning to see with the  
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#4

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

view "SCIENCE" **#3**  
inclusively



Murdena Marshall, Elder, Mi'kmaq Nation

**Together We Heal & Grow**  
seeing & acknowledging my deeds

“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.”



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

# I Got It From an Elder



Conversations  
in Healing  
Language

Iwama et al. 2007; Gaspereau Press Limited



Murdena Marshall, Elder, Mi’kmaq Nation

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# I Got It From an Elder



Conversations  
in Healing  
Language

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#5

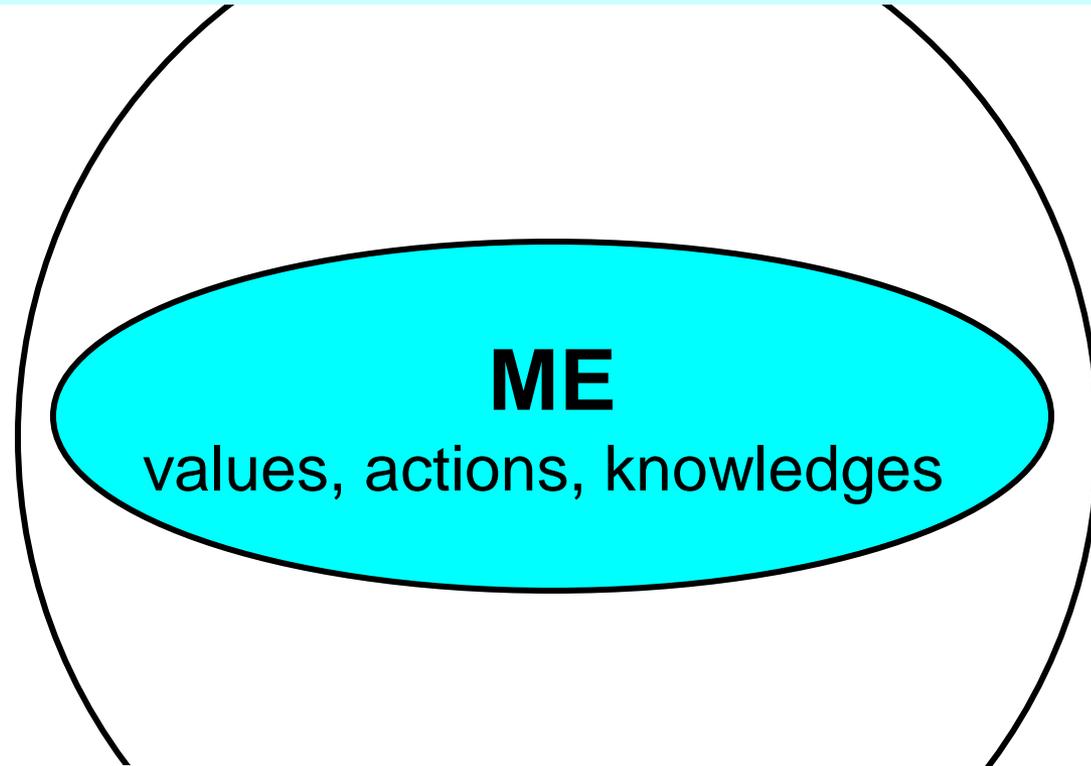
put our *values + actions + knowledges* in front of us ... like an object



Murdena Marshall, Elder, Mi’kmaq Nation

**Together We Heal & Grow**  
seeing & acknowledging my deeds

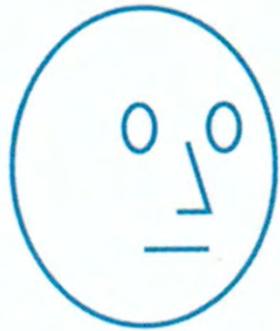
# the “HEALING TENSE”



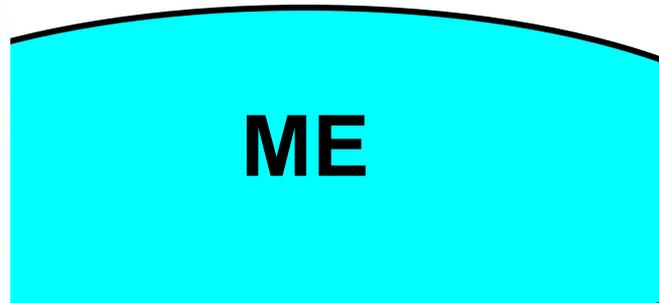
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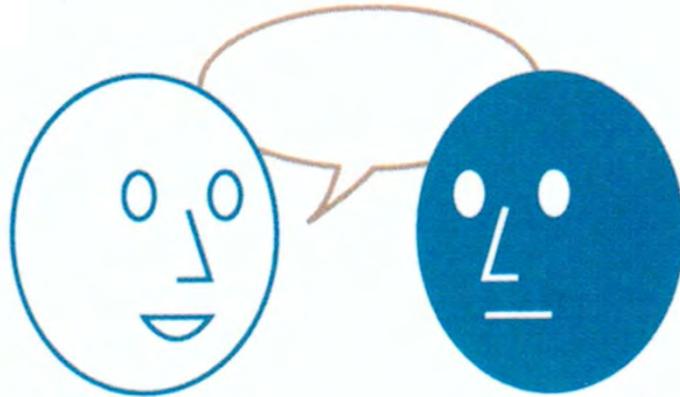
# the “HEALING TENSE”



**look at it, own it**



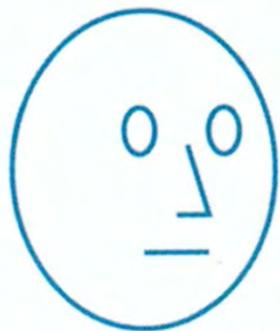
**acknowledge  
being it**



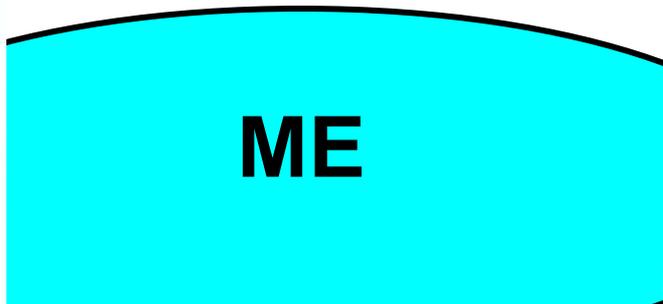
**talk to it, understand it**



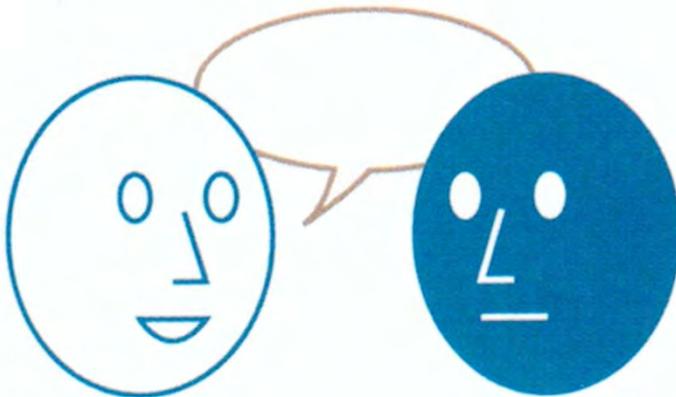
# “together we heal & grow”



**look at it, own it**



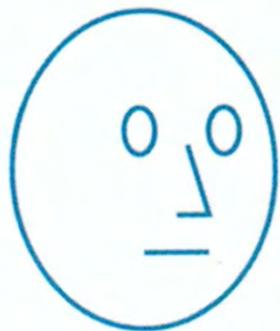
**acknowledge  
being it**



**talk to it, understand it**



# “together we heal & grow”



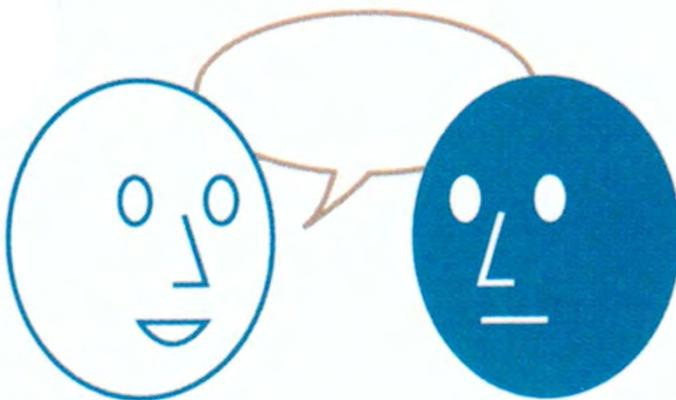
look at it, own it



**ME & YOU  
“US / WE”**



acknowledge  
being it



talk to it, understand it



# SEVEN LESSONS LEARNED

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

#1

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

#2

#4

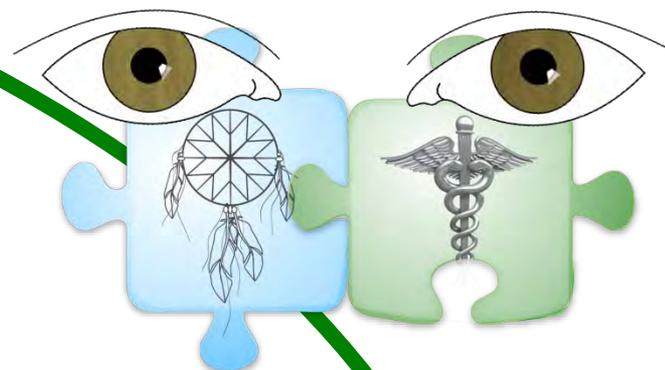
**DO ... in a  
CREATIVE, GROW  
FORWARD WAY**

view "SCIENCE"  
inclusively

#3

#5

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



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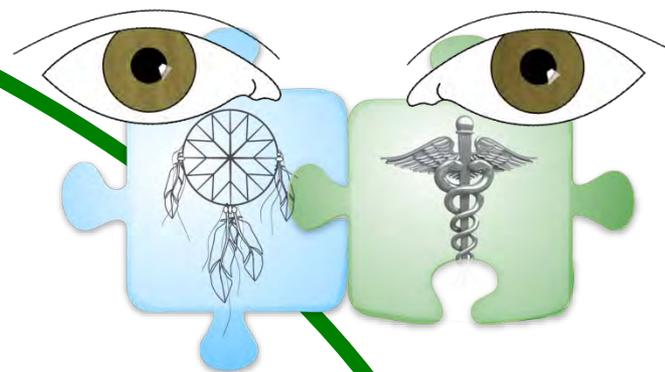
#3

#5

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

use **VISUALS**

#6



# FOUR BIG PATTERNS in our PHILOSOPHIES

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

#1

OUR WORLDS

**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

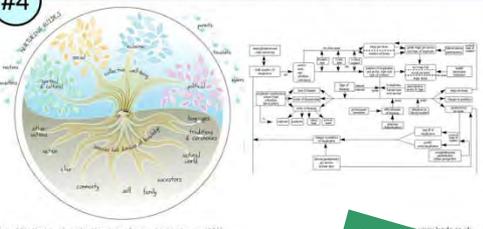
#3

OUR LANGUAGES and METHODOLOGIES

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

#4

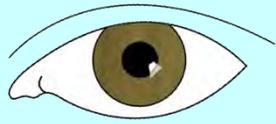
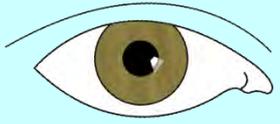
OUR OVERALL KNOWLEDGE OBJECTIVES



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

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

use **VISUALS** #6



# Two-Eyed Seeing

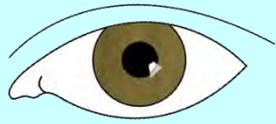
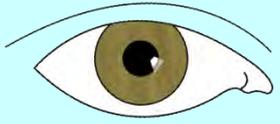
learning to see with the strengths of each & together

## OUR WORLDS

#1

BIG PATTERN  
in our  
PHILOSOPHIES

**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

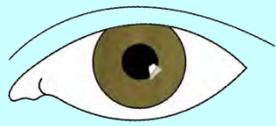
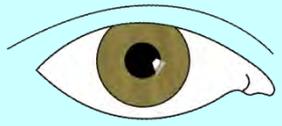
#1

**interconnective**

subject ...  
interconnective  
and animate:  
spirit +  
energy + matter

**parts & wholes**

object ...  
comprised of parts and  
wholes characterized by  
systems and emergences:  
energy + matter



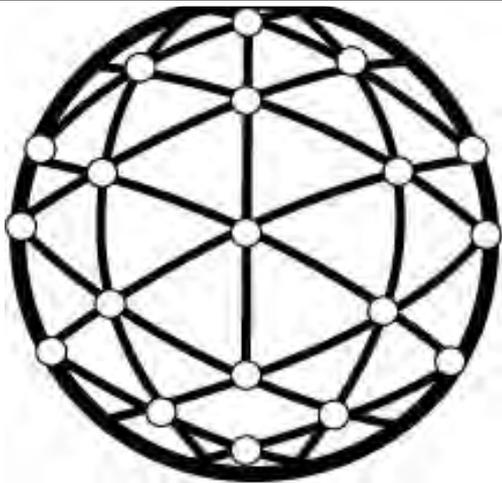
# Two-Eyed Seeing

learning to see with the strengths of each & together

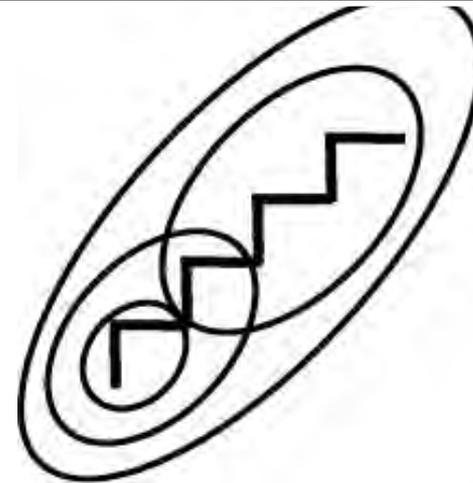
## OUR WORLDS

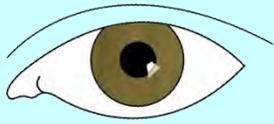
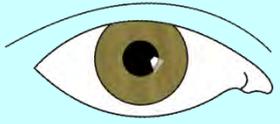
#1

**interconnective**



**parts & wholes**





# Two-Eyed Seeing

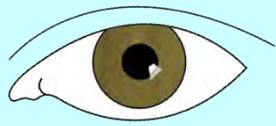
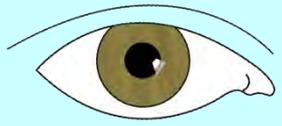
learning to see with the strengths of each & together

## OUR KEY CONCEPTS and ACTIONS

#2

BIG PATTERN  
in our  
PHILOSOPHIES

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



# Two-Eyed Seeing

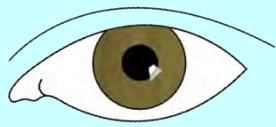
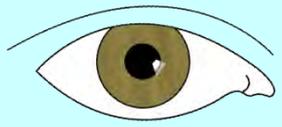
learning to see with the strengths of each & together

## OUR KEY CONCEPTS and ACTIONS

#2

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

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

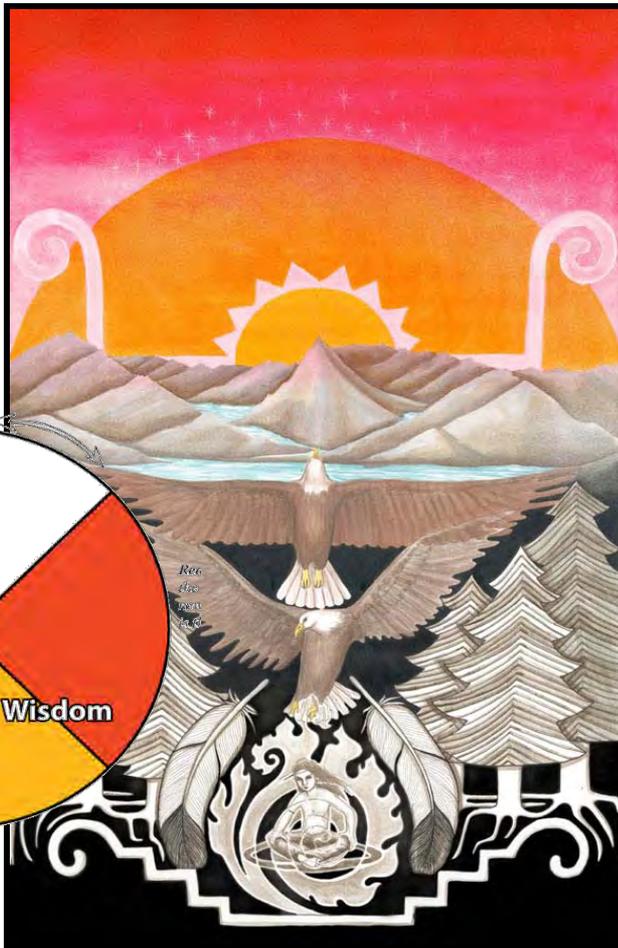


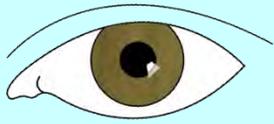
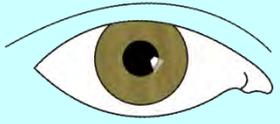
# Two-Eyed Seeing

learning to see with the strengths of each & together

## OUR KEY CONCEPTS and ACTIONS

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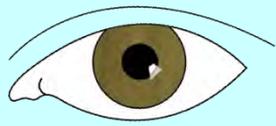
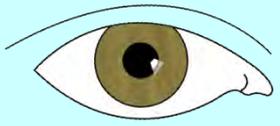
learning to see with the strengths of each & together

## OUR LANGUAGES and METHODOLOGIES

#3

BIG PATTERN  
in our  
PHILOSOPHIES

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



# Two-Eyed Seeing

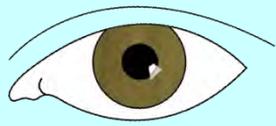
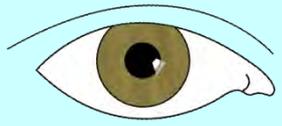
learning to see with the strengths of each & together

## OUR LANGUAGES and METHODOLOGIES

#3

*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

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



Life  
Love  
Land

vigour

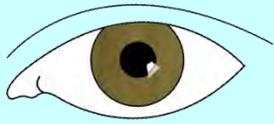
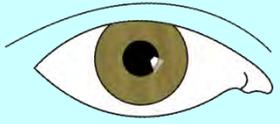
WEAVING



Math  
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UN-WEAVING



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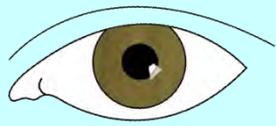
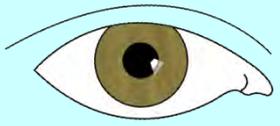
learning to see with the strengths of each & together

## OUR OVERALL KNOWLEDGE OBJECTIVES

#4

**BIG PATTERN**  
in our  
**PHILOSOPHIES**

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



# Two-Eyed Seeing

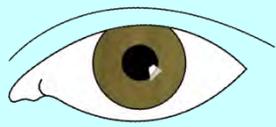
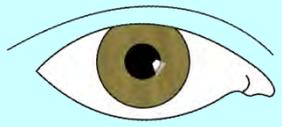
learning to see with the strengths of each & together

## OUR OVERALL KNOWLEDGE OBJECTIVES

#4

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

dynamic, testable,  
published knowledge  
independent of  
personal experience  
that can enable  
prediction and control



# Two-Eyed Seeing

learning to see with the strengths of each & together

## OUR OVERALL KNOWLEDGE OBJECTIVES

#4

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

**towards resonance  
of understanding  
within environment**

dynamic, testable, published knowledge independent of personal experience that can enable prediction and control

**towards construction  
of understanding  
of environment**



# Two-Eyed Seeing

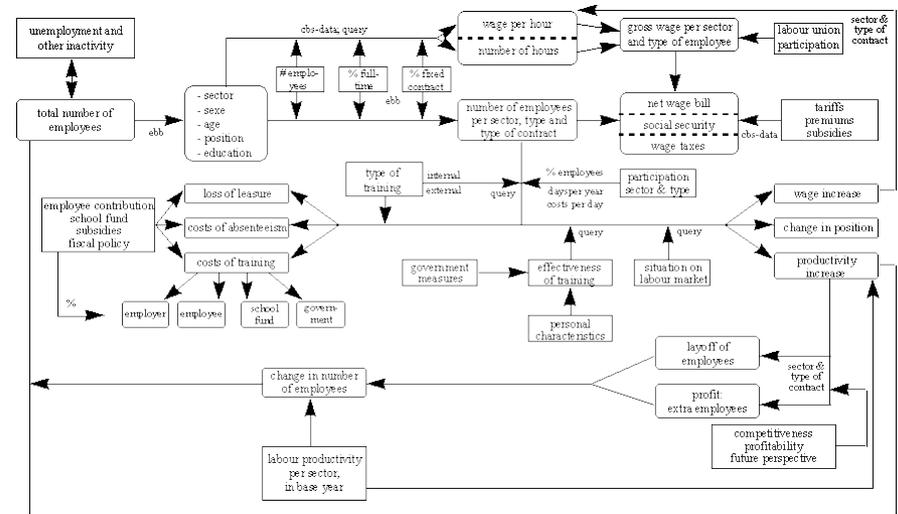
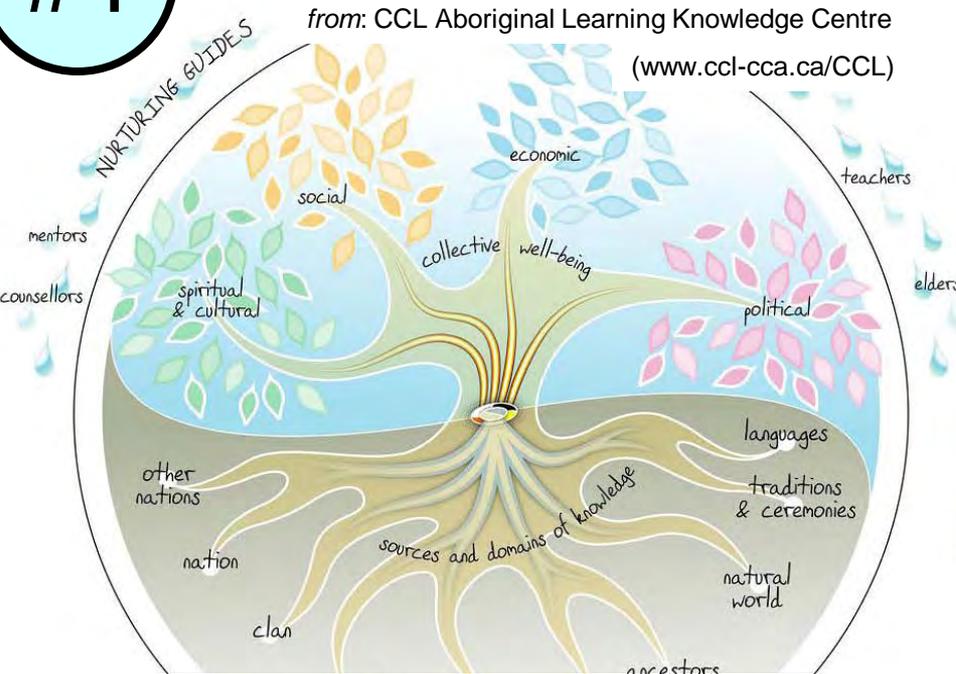
learning to see with the strengths of each & together

## OUR OVERALL KNOWLEDGE OBJECTIVES

#4

from: CCL Aboriginal Learning Knowledge Centre  
(www.ccl-cca.ca/CCL)

from: www.leads.ac.uk



towards resonance  
of understanding  
within environment

towards construction  
of understanding  
of environment

# SEVEN LESSONS LEARNED

#1

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

#4

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

#5

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

use **VISUALS**

#6

#2

view "SCIENCE"  
inclusively

#3



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put our *values + actions*  
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us ... like an object

**WEAVE**

back and forth  
between our

#7

weave via  
**BIG PICTURES**

use **VISUALS**

#6

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view "SCIENCE"  
inclusively

#3



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us ... like an object

## WEAVE

back and forth  
between our

#7

weave via  
**BIG PICTURES**

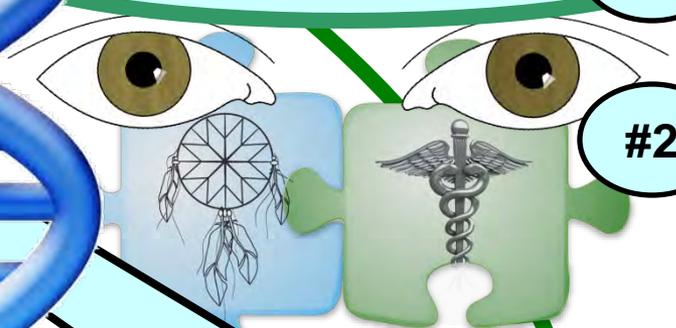
use **VISUALS**

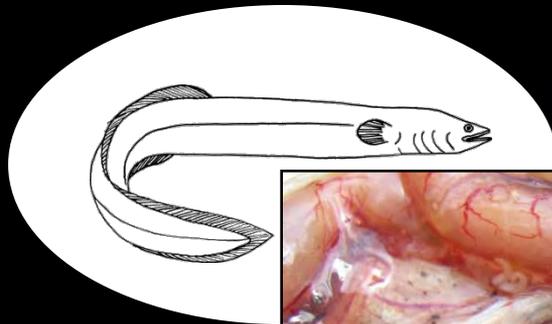
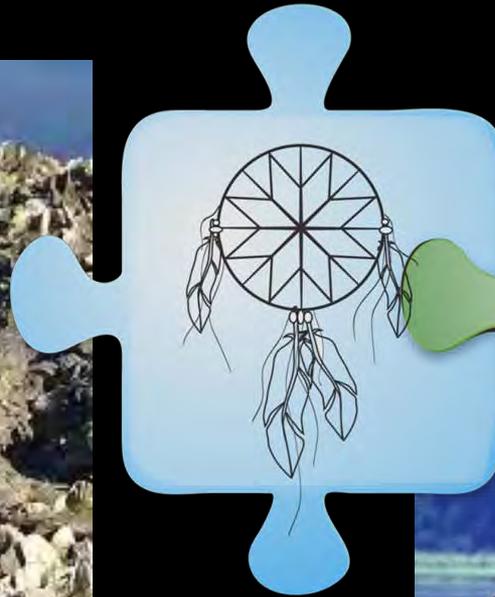
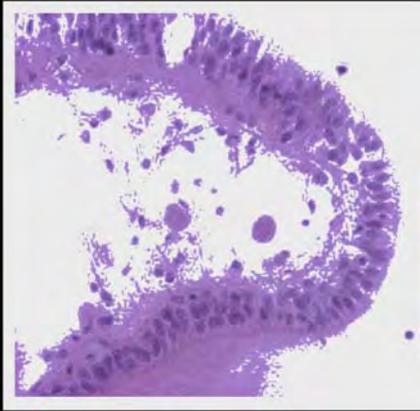
#6

#2

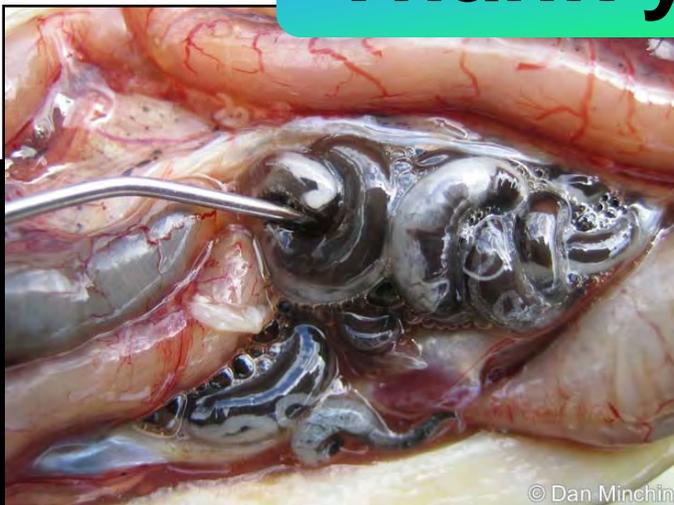
view "SCIENCE"  
inclusively

#3





**Thank you / Wela'liog**



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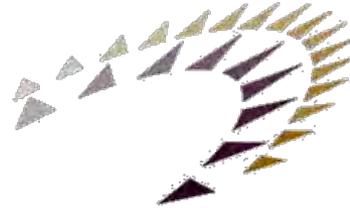
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