

TWO-EYED SEEING

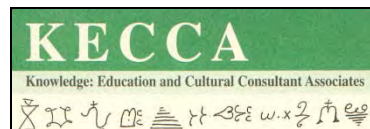


seeing with the strengths of bringing together
Indigenous & Western Scientific Knowledges

Science Cafe

Acadia University; 6 November 2006

Elder Albert Marshall
Eskasoni First Nation
Cheryl Bartlett, PhD
Marilyn Iwama, PhD



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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



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IAPH

SABLE OFFSHORE ENERGY INCORPORATED

IWK Health Centre Foundation

Mi'kmaq Elders

NOVA SCOTIA Health Research FOUNDATION

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

KECCA Knowledge: Education and Cultural Consultant Associates

NSERC CRSNG

Mi'kmawey Debort

Royal Canadian Mounted Police / Gendarmerie royale du Canada

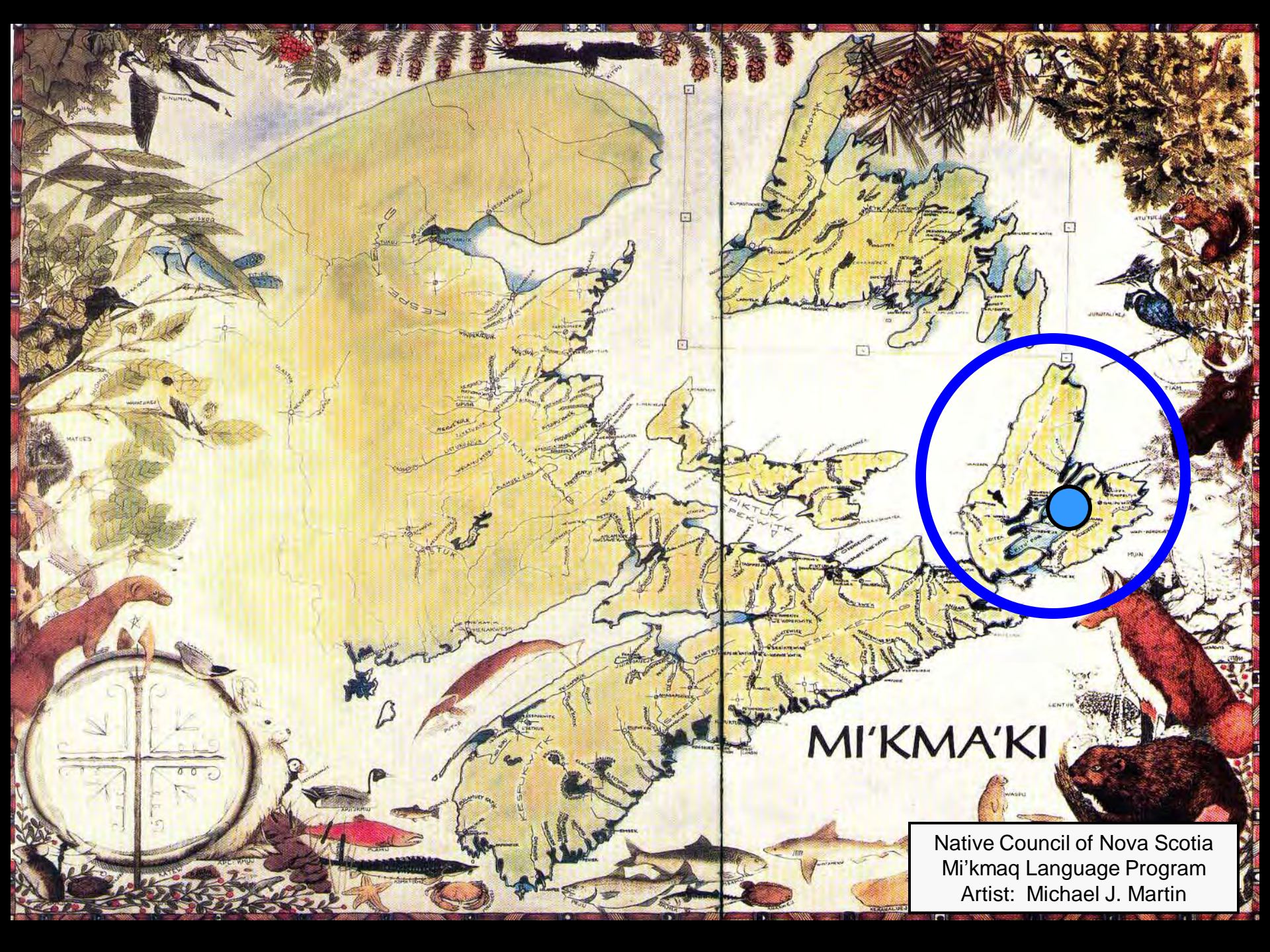


“Two-Eyed Seeing”

seeing with the strengths of each & together



**Mr. Albert Marshall, Mi'kmaq Elder
Eskasoni First Nation**

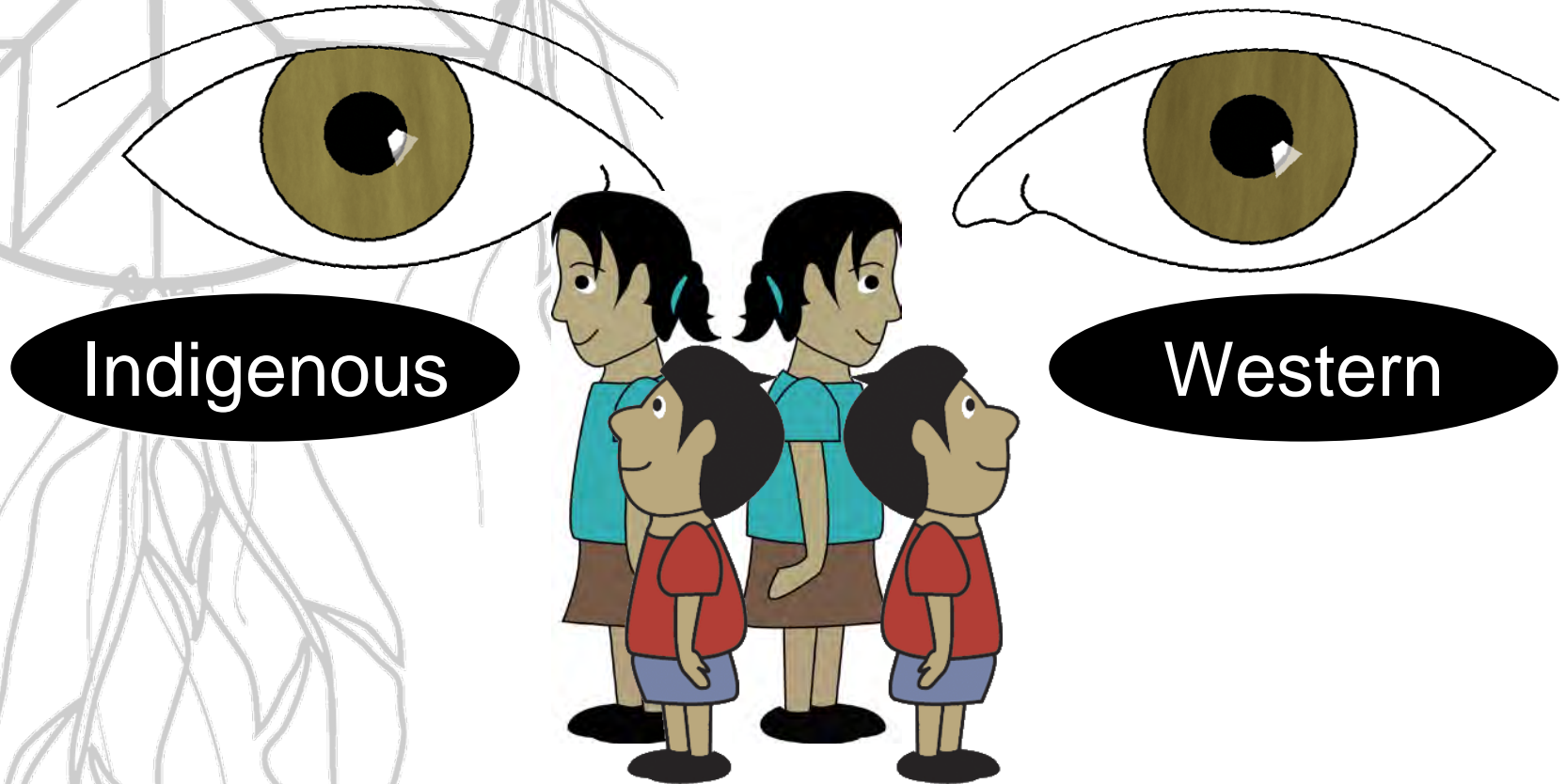


MI'KMA'KI

Native Council of Nova Scotia
Mi'kmaq Language Program
Artist: Michael J. Martin

WHY???? Because today ...

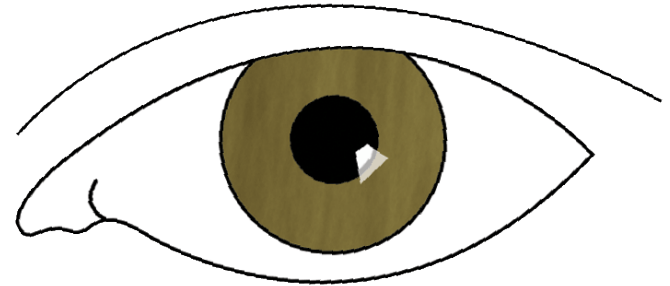
Mi'kmaq and other Aboriginal young people are poised on the edge of two worlds.



WHY???? Because today ...

Mi'kmaq and other Aboriginal young people are poised on the edge

**Cognitive imperialism.
Colonization of
the consciousness.
Genocide.**



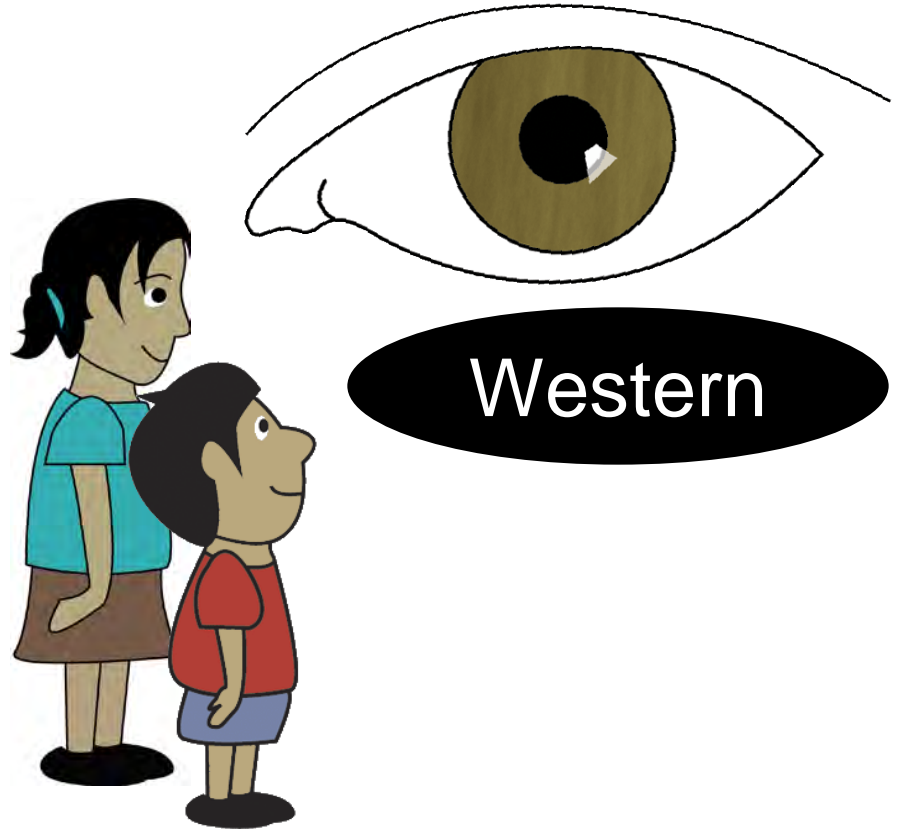
Western

WHY???? Because today ...

The central dilemma of science education is the teaching of science from only one perspective ...

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

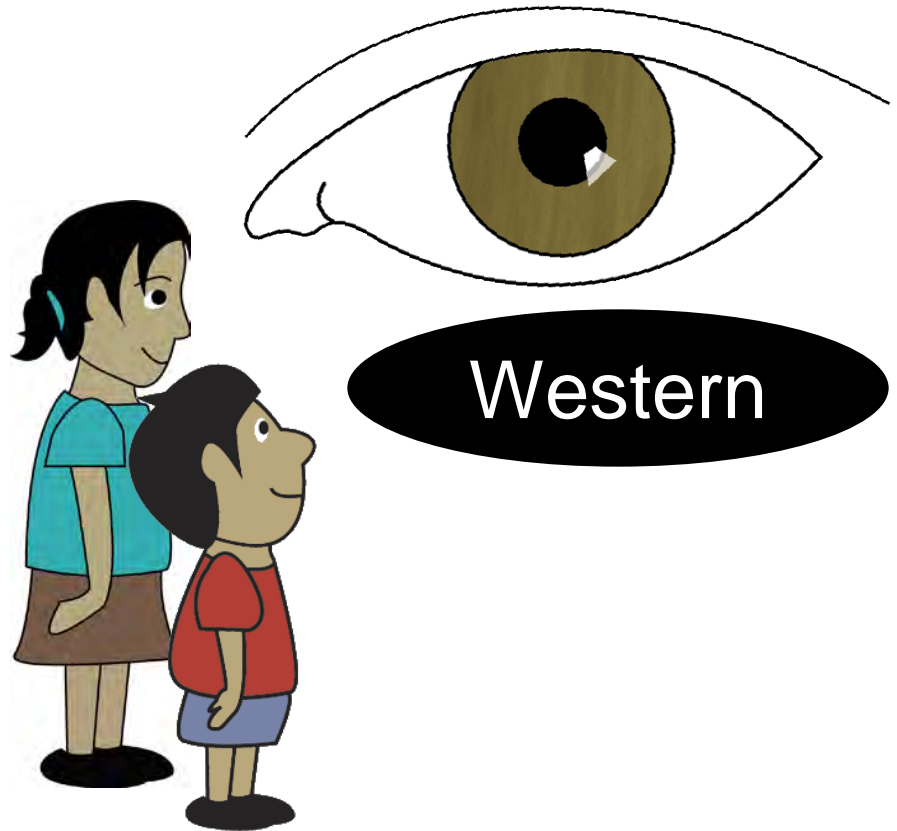
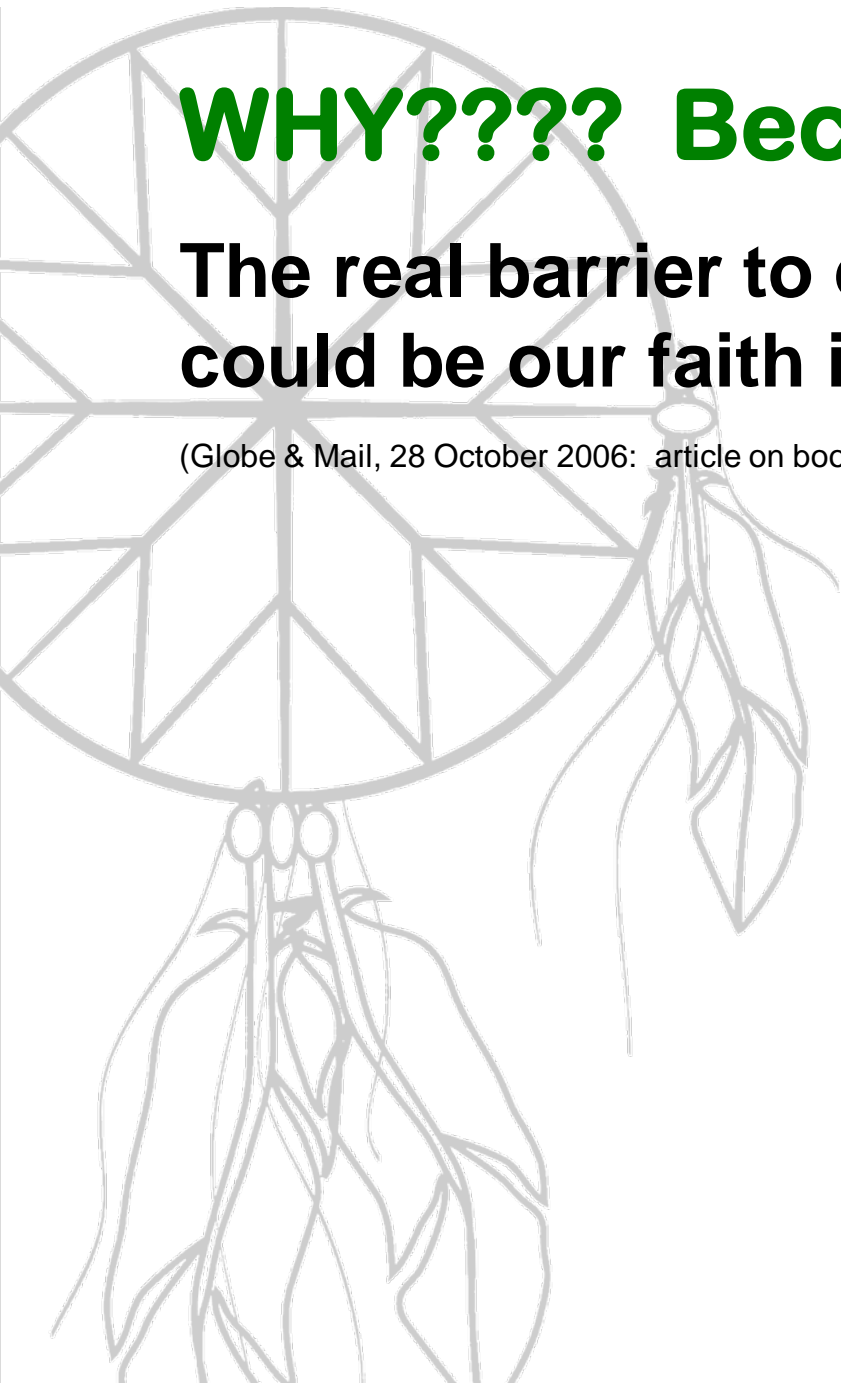
**Cognitive imperialism.
Colonization of
the consciousness.
Genocide.**



WHY???? Because today ...

The real barrier to environmental change could be our faith in [Western] science.

(Globe & Mail, 28 October 2006: article on book by George Monbiot "Heat: how to stop the planet from burning")



Mi'kmaq World View

Mother Earth provides for us, shelters us, nourishes us. We must look to her good examples for guidance.



from: "Winds of Change"
Roy Thomas, Ahnishabae-born
Ojibwa artist; 1949-2004



from: Mi'kmaq Family
and Children Services

**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.**

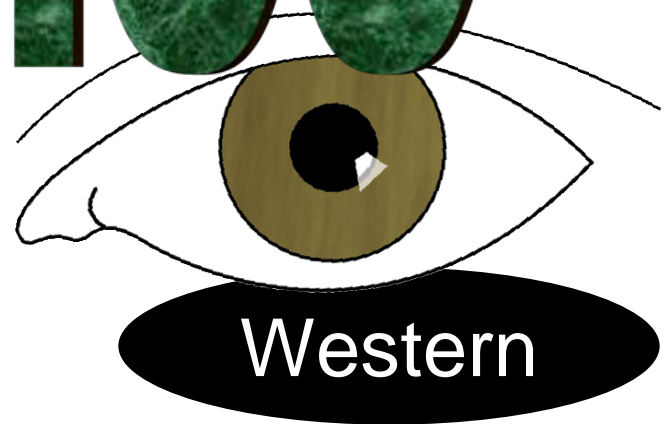
(late Mi'kmaq Chief, Spiritual Elder, and Healer Charlie Labrador)

Indigenous

Western

from Two Eyes

Science



from Two Eyes

domain of the
unknown

domain of the
known

Change



FEAR

domain of the
unknown

domain of the
known

Change



FEAR

domain of the
unknown

Eagle
ONE WHO SEES BIG PATTERNS



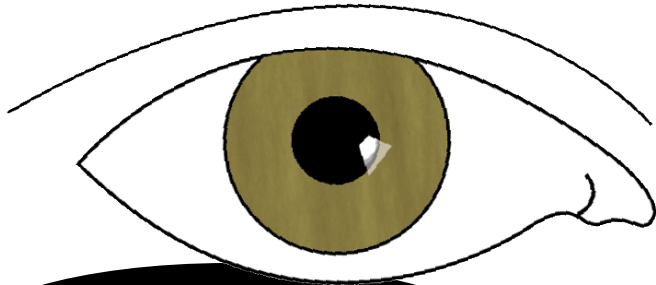
domain of the
known



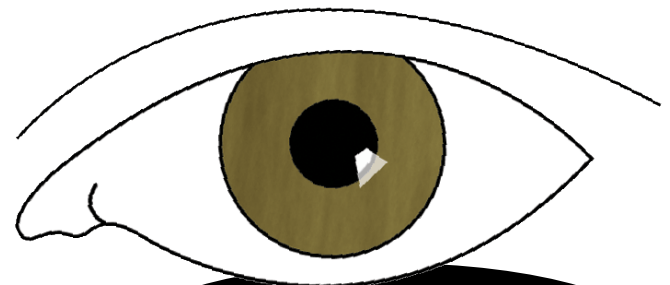
must become PATTERN-able

Douglas J. Cardinal; world renown architect

Science from Two Eyes



Indigenous



Western

use a “PATTERN-able” approach

stories of our interactions with and within nature

Science

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

Both result from the same intellectual process of creating order (pattern) out of disorder.



Artist Basma Kavanagh

stories of our interactions with and within nature

Science

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

Both result from the same intellectual process of creating order (pattern) out of disorder, and then communicating this to others (**stories**).



Artist Basma Kavanagh

stories of our interactions with and within nature

Science

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

Both result from the same intellectual process of creating order (pattern stories).

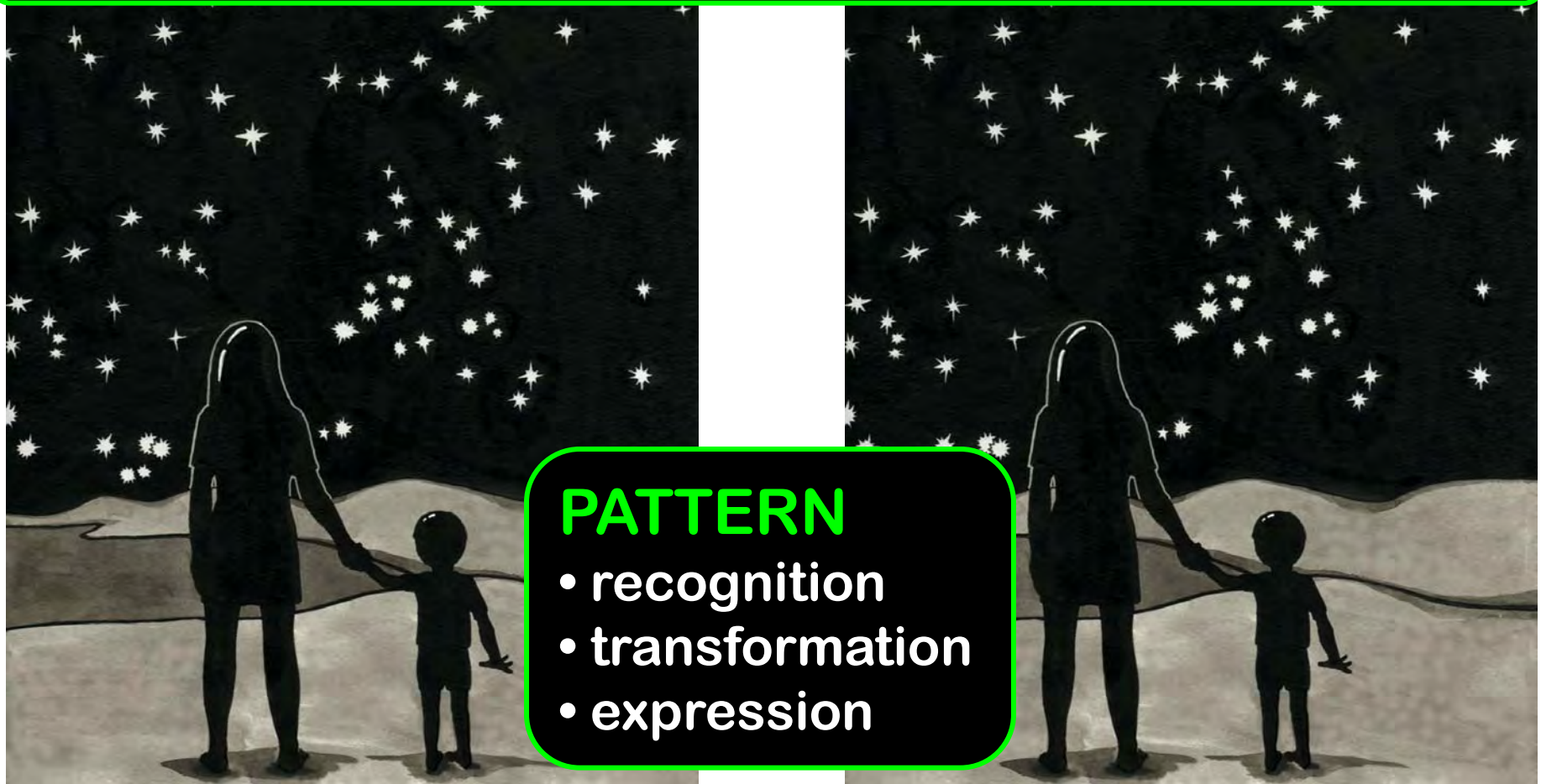


Artist Basma Kavanagh

PATTERN RECOGNITION

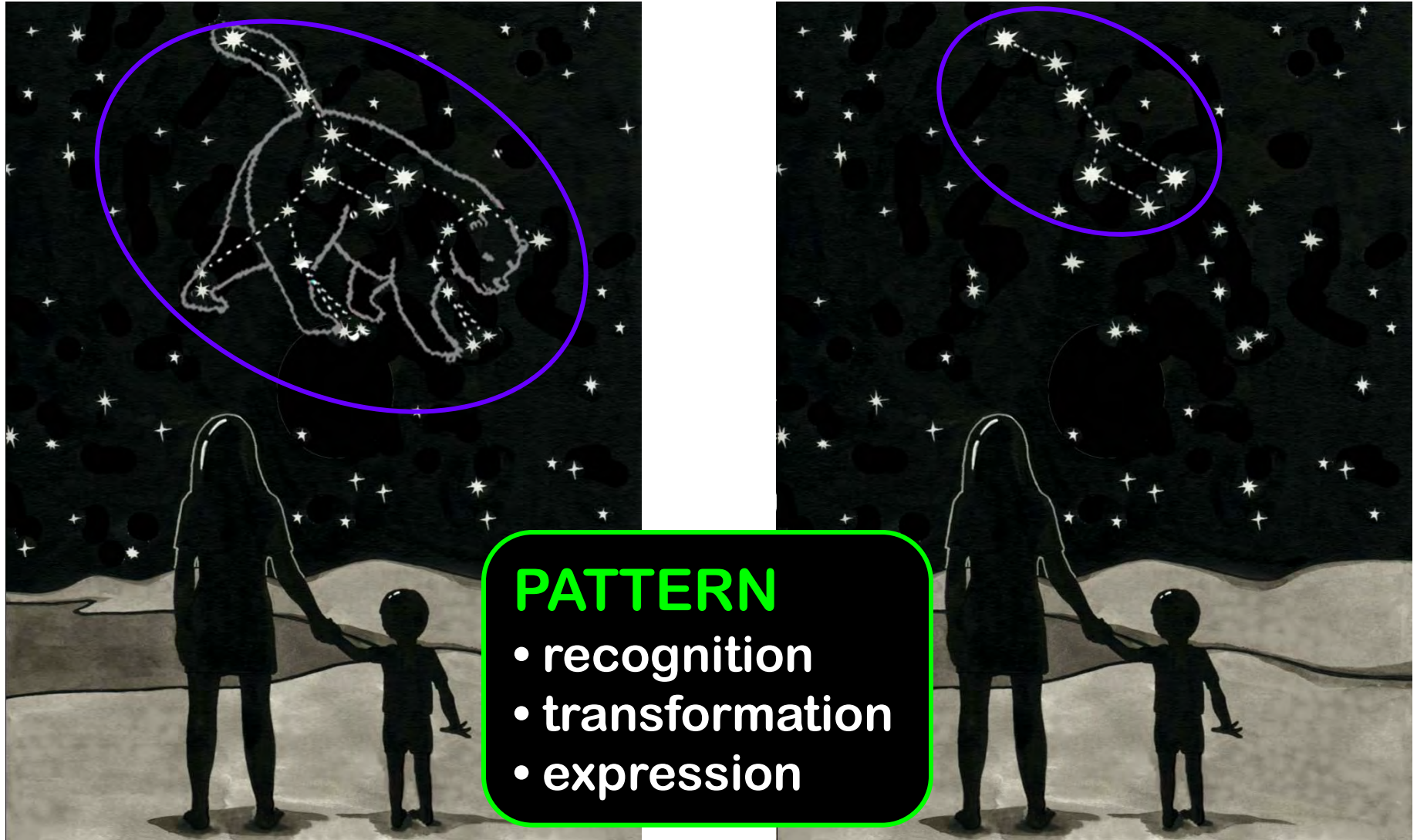
Science is pattern-based knowledge.

stories of our interactions with and within nature



Artist Basma Kavanagh

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



PATTERN

- recognition
- transformation
- expression

Artist Basma Kavanagh

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



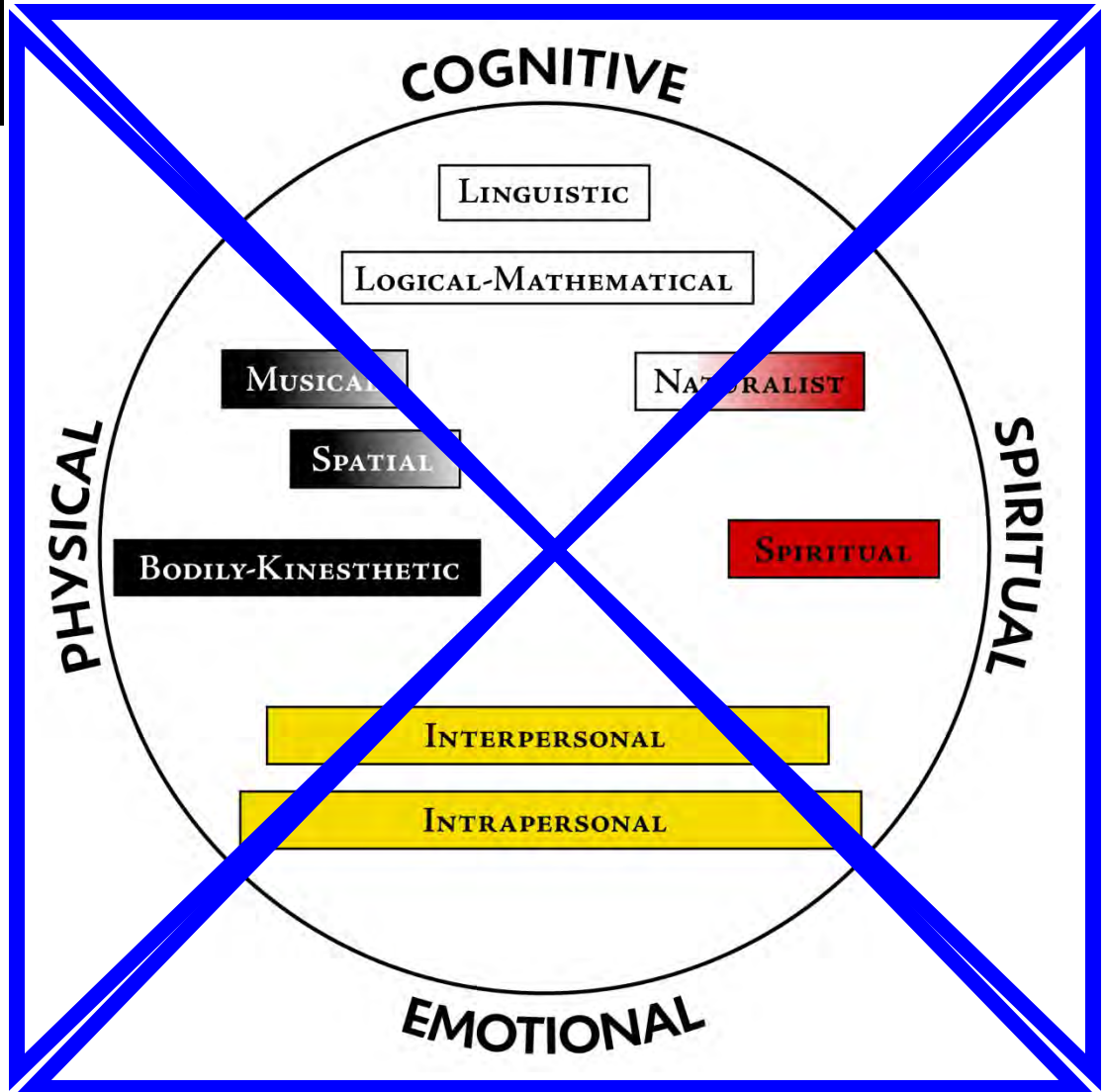
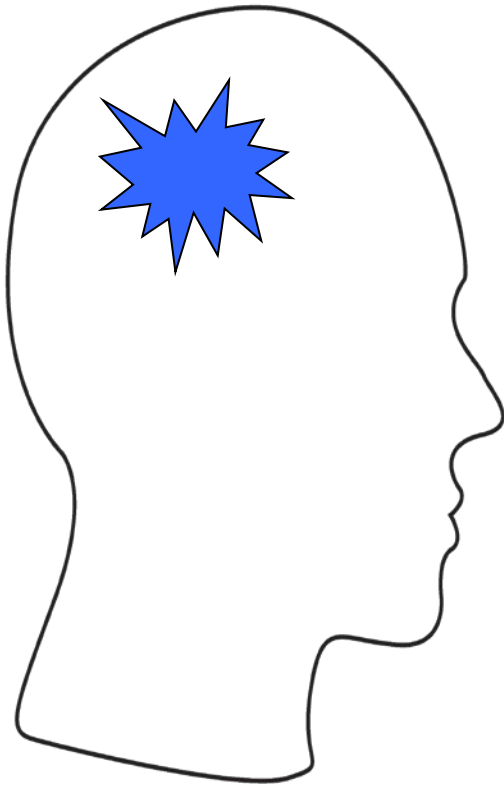
Artist Basma Kavanagh

Indigenous and Western Sciences are pattern-based knowledges. Our stories may differ ... due to the richness of “pattern smarts” employed.

“human pattern smarts”

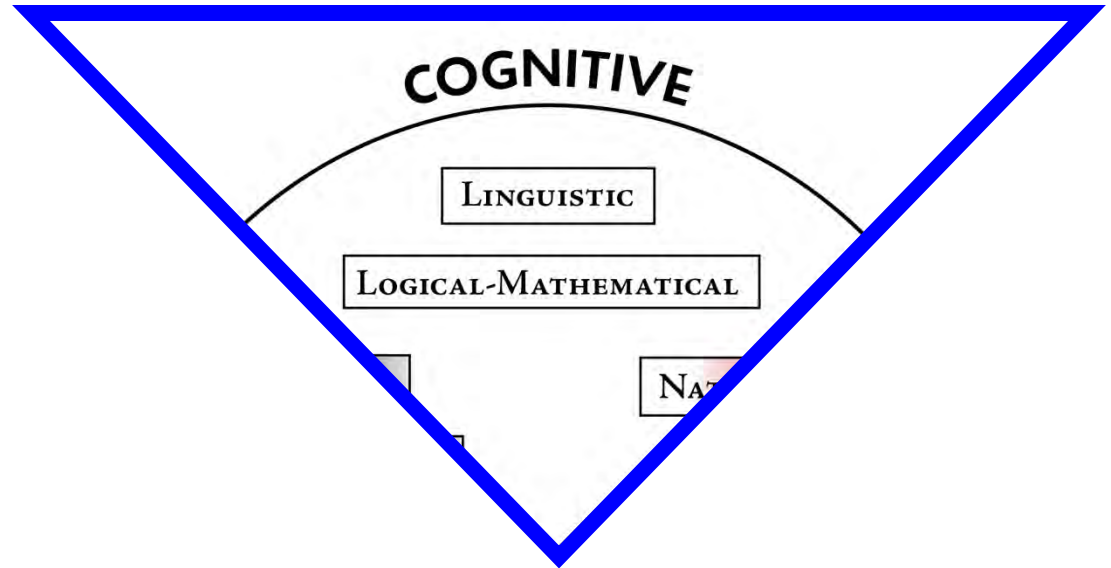
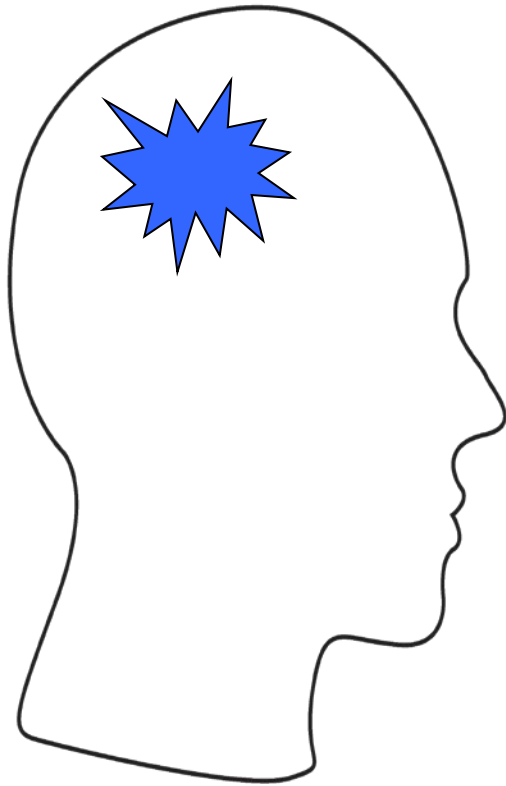
multiple intelligences (brain-based theory, H. Gardner, Harvard Univ.)

possible mapping onto
four quadrants



stories of our interactions with and within nature

“pattern smarts”



stories of our interactions with and within nature

Science

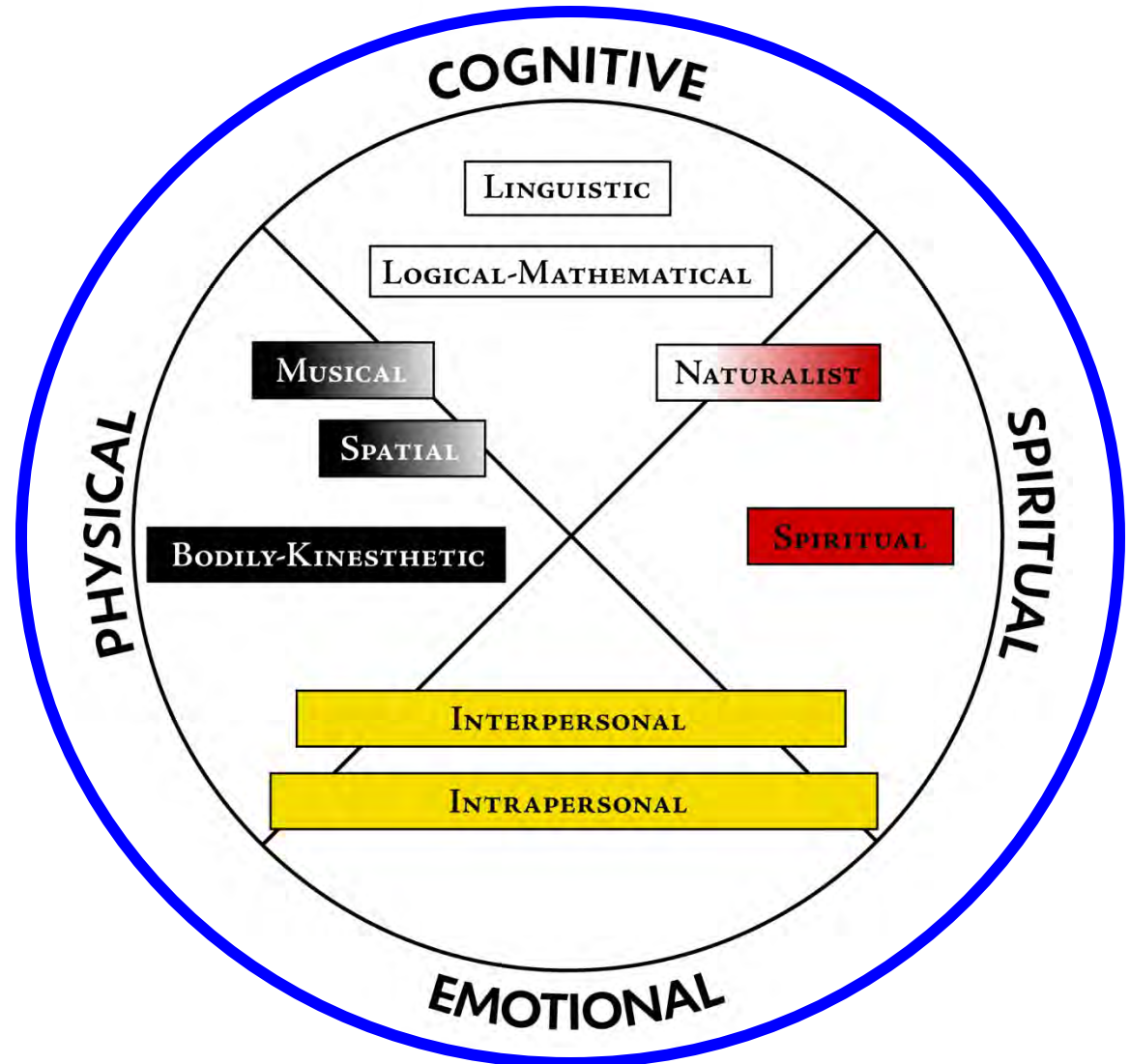
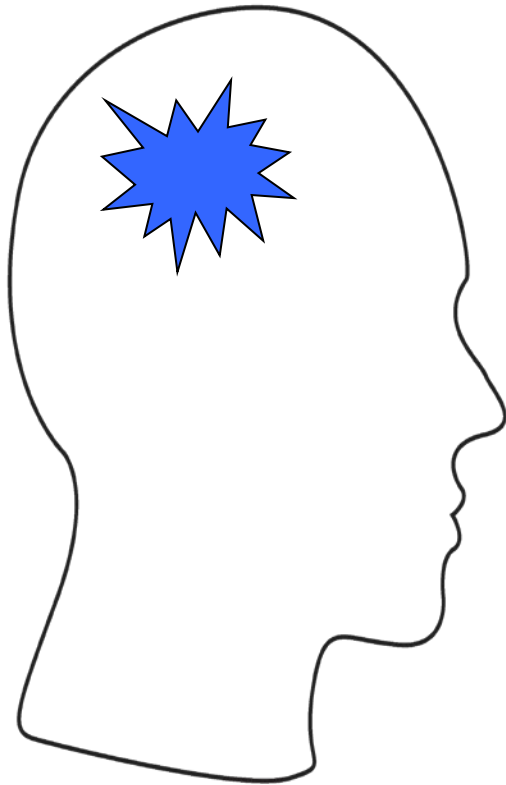
The periodic table is color-coded by groups: Group 1 (blue), Group 2 (light blue), Groups 13-18 (orange, pink, purple), Groups 3-10 (green), and Groups 11-12 (yellow). The f-block elements are shown in two rows below the main table: Lanthanides (red) and Actinides (orange).

1 H Hydrogen																	2 He Helium							
3 Li Lithium	4 Be Beryllium											5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon							
11 Na Sodium	12 Mg Magnesium											13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon							
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt								28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium								46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon
55 Cs Cesium	56 Ba Barium	57-71 Lanthanides	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium								78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon
87 Fr Francium	88 Ra Radium	89-103 Actinides	104 Unq Unnilquadium	105 Unp Unnilpentium	106 Unh Unnilhexium	107 Uns Unnilseptium	108 Uno Unniloctium	109 Uue Unnilennium								110 Dh Dharmium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson
			57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium								63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
			89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium								95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium

Periodic Table of the Elements

stories of our interactions with and within nature

“pattern smarts”

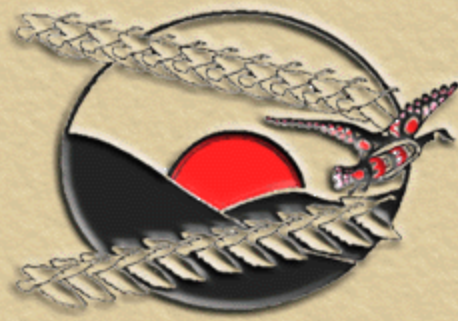
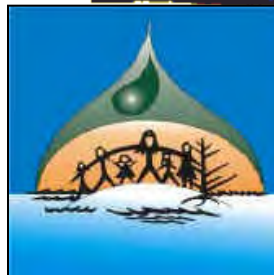


stories of our interactions with and within nature

Science



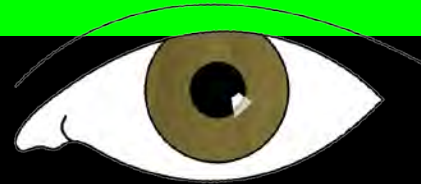
Life
Love
Land



Two-Eyed Seeing: strengths key concepts & actions



- respect
- relationship
- reverence
- reciprocity
- ritual
- repetition
- responsibility



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

Two-Eyed Seeing: strengths languages & methodologies



vigour

Life, Love, Land



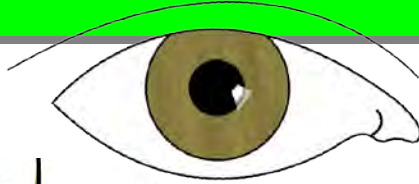
rigour

Mathematics

WEAVING

UN-WEAVING

Two-Eyed Seeing: strengths overall knowledge objectives



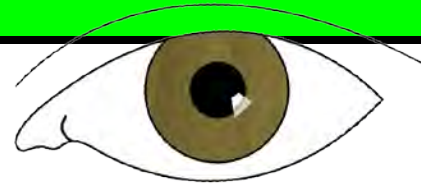
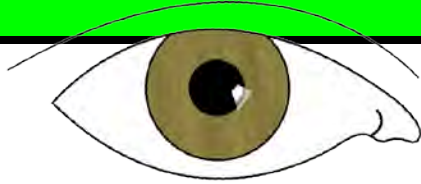
towards resonance
of understanding
within environment



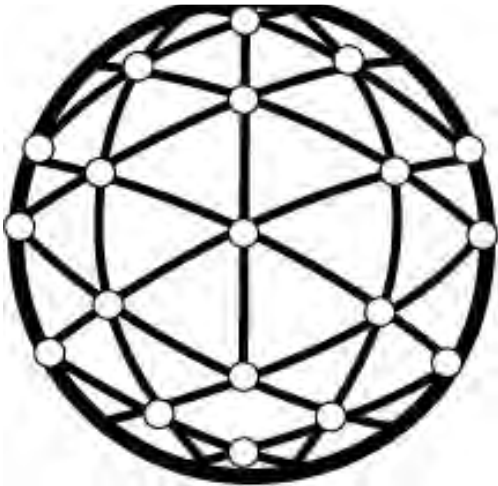
towards construction
of understanding
of environment

Two-Eyed Seeing

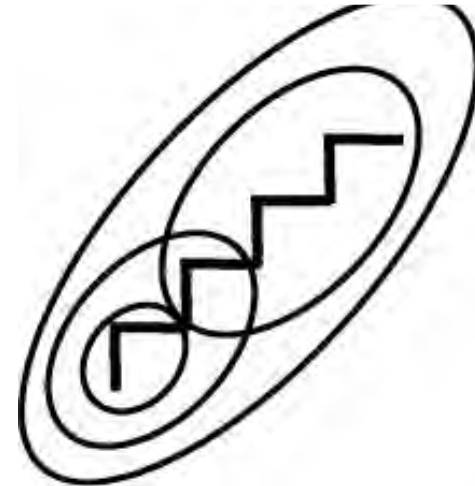
one Creation: plural views



interconnected



parts & wholes





**participatory
creative choice**



**Wjipenuk Etek
Lnuimlkikno'ti
- Spirit of the East -**

East (sunrise)

**... a place of
beginnings and
enlightenment**

**... where new
knowledge can be
created or received
to bring about
harmony or right
relations.**



“pattern seeing”



F. Scott

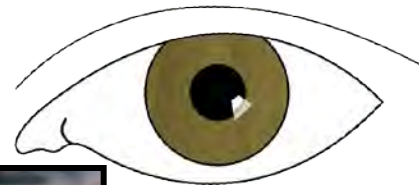
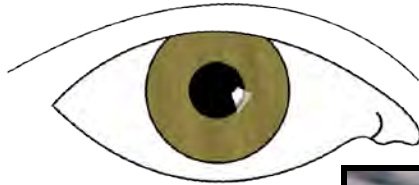
Mte'skmwaqsi
“snakes –
plants bunched”



fiddlehead fern
[*M. struthiopteris*]



what our “pattern seeing” (re)generates



subject-subject

subject - object

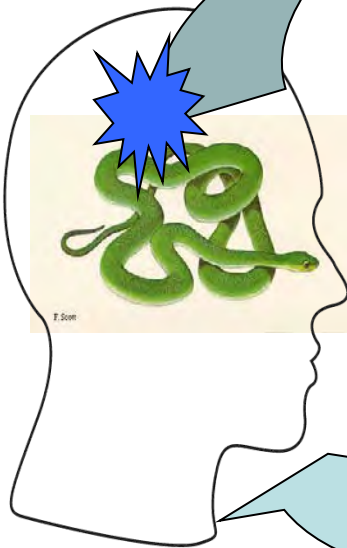


**eco-
reflexive &
participatory**

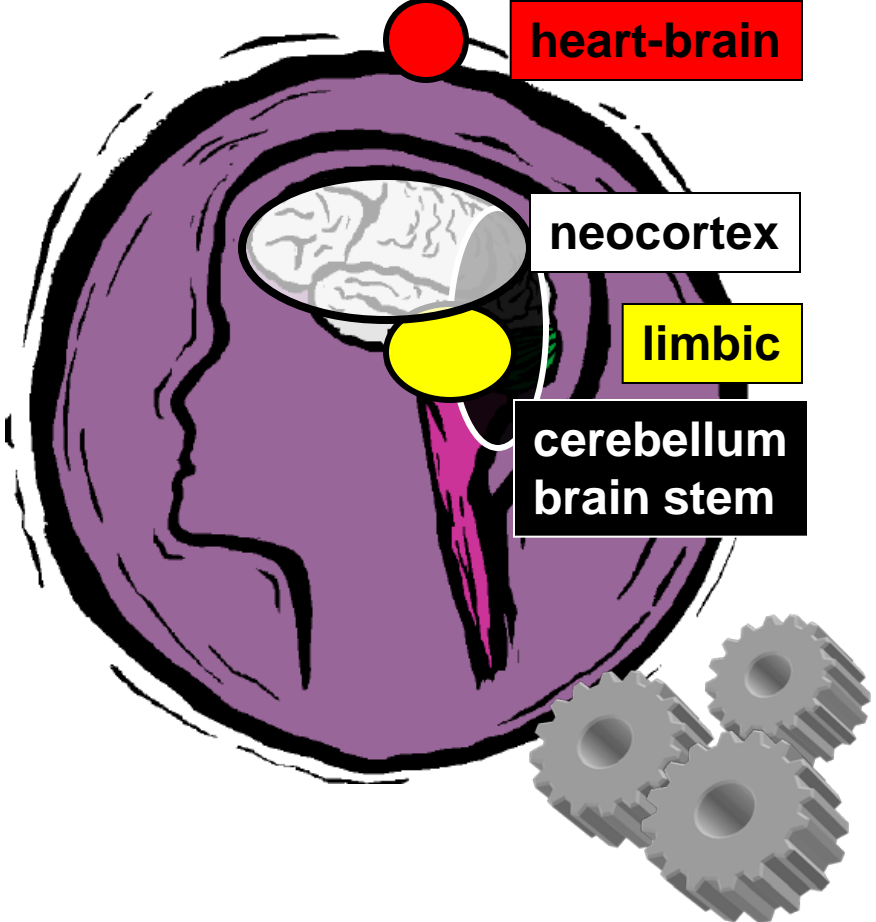
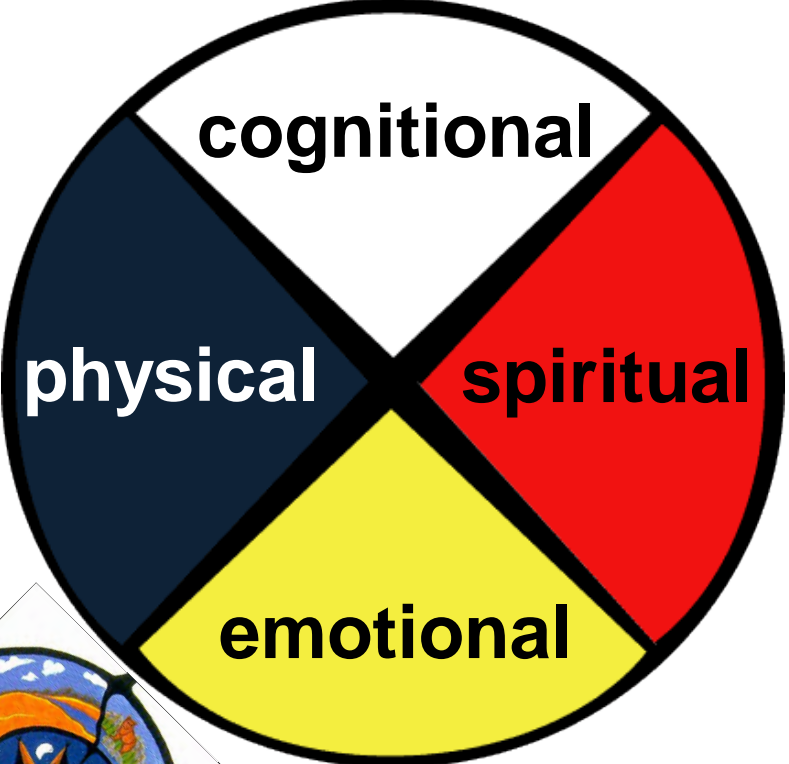
**cogno-
centric &
detached**

connectedness

disconnectedness



what we "see" as: HUMAN

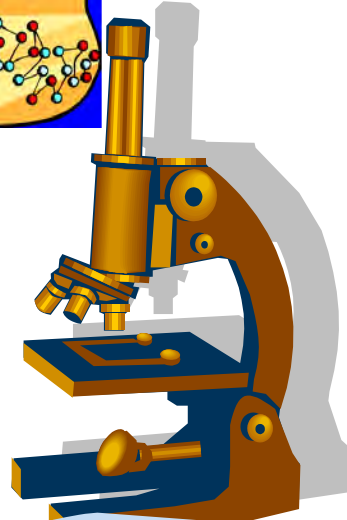
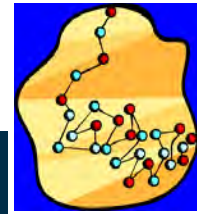


what we "see" as: MOTHER-CHILD



from:
Mi'kmaq Family
& Children's
Services

what we "see" as: HUMAN HEALTH



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

Language has Spirit.

Language allows us to teach respect.

Oqwatnuk (North)
... wisdom



Tkisnuk (West)
... unknown



Wjipnuk (East)
... newness



Pkite'snuk (South)
... fullness

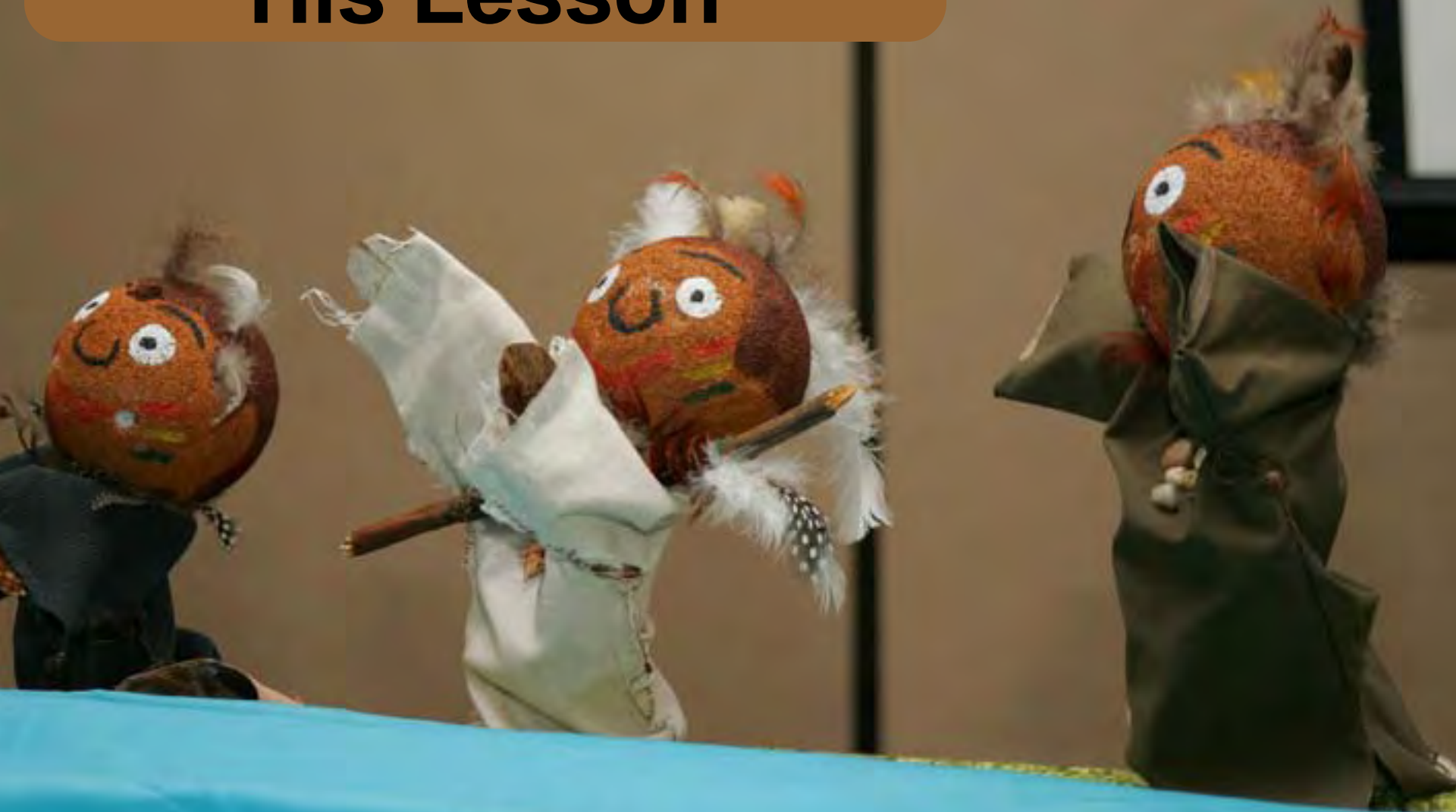


Puppets have “magic”.

Puppets allow us to teach language.



How Bullfrog Learns His Lesson



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 Ivar Mendez)

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.”

(Murdana Marshall, in conversation with Ivar Mendez)

Generalize

ketkiya – I am drunk

ketkiyayop – I was drunk

ketkiyayasnek – I was drunk



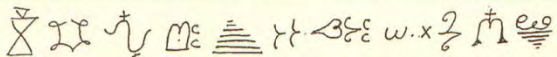
Love is the main ingredient of wellness.

Murdena Marshall



KECCA

Knowledge: Education and Cultural Consultant Associates



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@ns.sympatico.ca



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Co-Learning

It is not enough to just value the links between the experiences, disciplines, creativity, and ideas (as in inter & multi disciplinarity) ...

... in trans - disciplinary work ...

... in trans - cultural work ...



... one has to develop methods, strategies, and practices that will transform those links to the real connections.

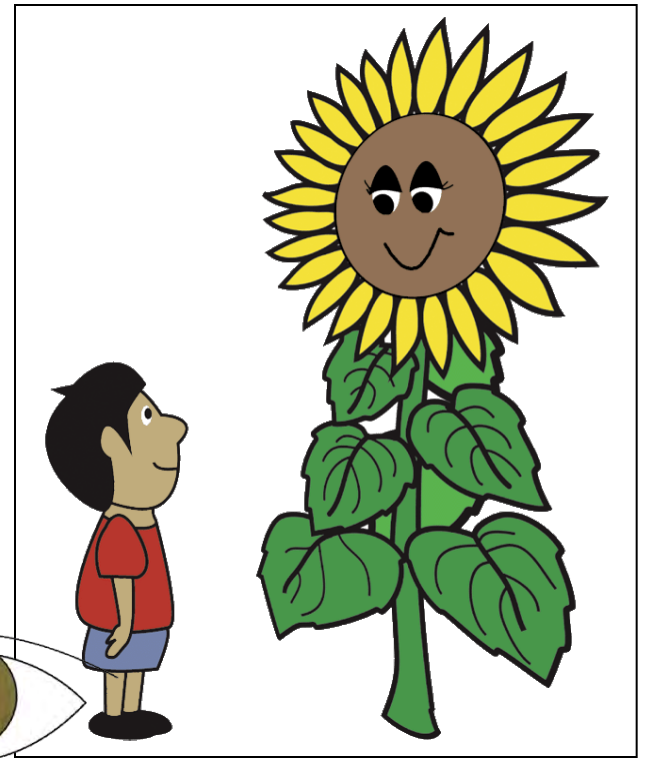
[adapted from Ron Burnett at http://www.chocuk.net/troupe/isin_onol1.html]

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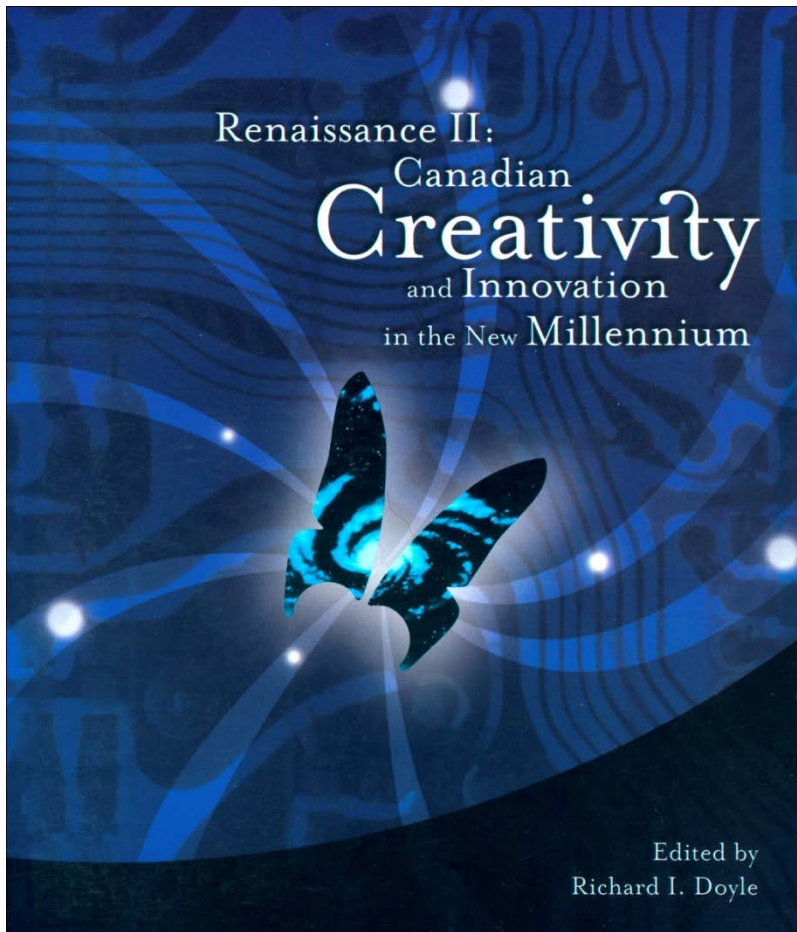
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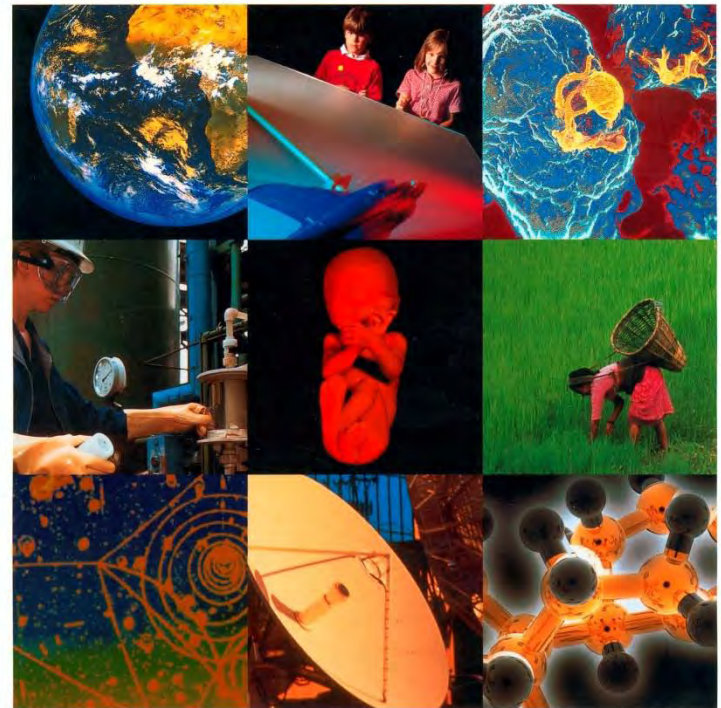
UNESCO: 2000



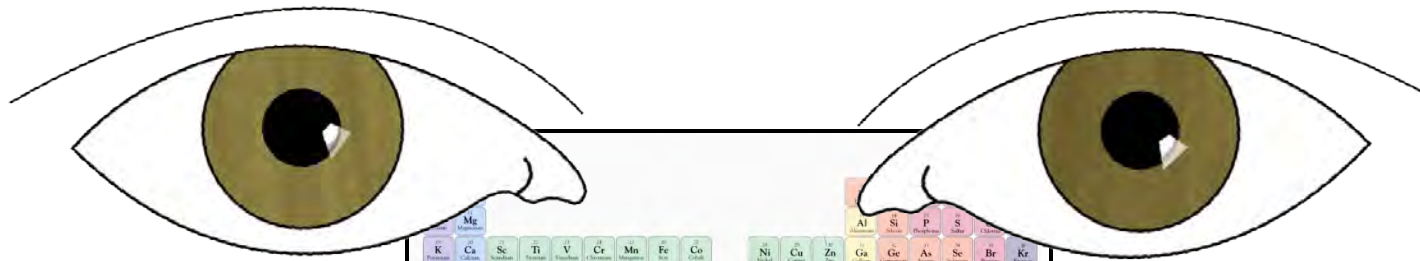
NRC: 2001



WORLD CONFERENCE ON SCIENCE



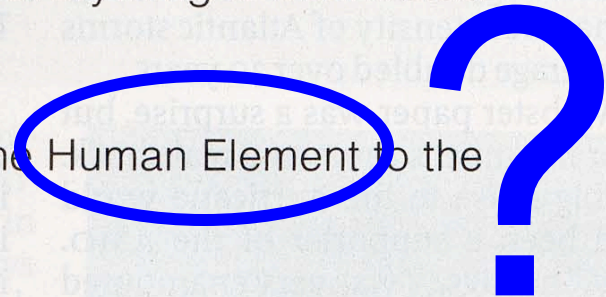
SCIENCE FOR THE TWENTY-FIRST CENTURY
A New Commitment




Setford, Steve. 1996. Science Facts. Firefly Books Ltd., Willowdale, ON. (pp. 36-37)

CHANGING THE FACE OF CHEMISTRY. To see that everything is connected

simply change one thing—and everything changes. Add the Human Element to the



 Periodic Table of the Elements, and suddenly the power of chemistry is put

to work solving human problems. Making the world safer, cleaner and



greener for generations to come. Meet the new face of chemistry: the Human Element.

PATTERN-BASED KNOWLEDGE

Sherman's Lagoon

OKAY, WE'RE HERE AT THE MALL. WHERE'S THIS WATCH YOU WANT TO BUY?

PATIENCE.
PATIENCE.

ONE DOESN'T JUST RUSH INTO THE MALL FOR A QUICK ITEM AND LEAVE. IT'S NOT A CONVENIENCE STORE.

ONE MUST TAKE IT ALL IN. MEASURE THE VIBE. SOAK UP THE AMBIENCE. FIND PATTERNS AND IDENTIFY THE DISTURBANCES.

TRANSLATION?

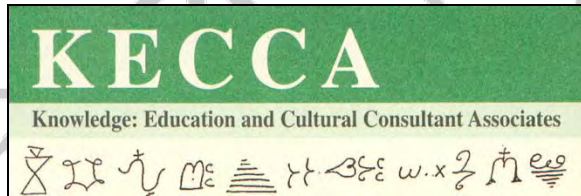
YOU'RE HERE ALL DAY, PAL.

<http://www.shermanslagoon.com>

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Wela'liog



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Thank You



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