

**Mimesis within a
*pattern transformation
conceptual framework*
for Integrative Science
for the 21st Century**

**Colloquium on Violence and Religion 2006
“Mimesis, Creativity, and Reconciliation”
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Cheryl Bartlett, PhD

**Canada Research Chair
in Integrative Science
Department of Biology
Sydney, Nova Scotia**

**CAPE BRETON
UNIVERSITY**



ABSTRACT: Integrative Science” is defined as “the bringing together of Indigenous and Western scientific knowledges”. It emerged at Cape Breton University (CBU) in Sydney, Nova Scotia, in the late 1990's as a joint university-Aboriginal community initiative to bring innovation to university level science curricula and pedagogy, as part of an effort to attract more Mi'kmaq First Nations students into the post-secondary sciences. Since its beginnings in the science education arena, Integrative Science at CBU has broadened to include a Tier 1 Canada Research Chair with projects in the arenas of science research (e.g. Aboriginal health) and science applications (e.g. ecosystem stewardship). Towards Integrative Science-implicated research in these three arenas, I have developed a conceptual framework based in *pattern recognition and transformation* that explicitly seeks to enable transit of pedagogy and praxis across the boundaries of methodologies, disciplines, and world views. Simply put, it is a three-piece iterative approach: (1) Observation of “external natural pattern” is sensory, drawing upon sanctioned or privileged perspective from methodologies, disciplines, or world views contextualized by mimesis (subject-subject participatory reciprocities) or alterity (subject-object causal relationships). (2) Interpretation is poietic, drawing upon sanctioned or privileged intelligences (from among those in Howard Gardner’s “multiple intelligences theory”) to yield “internal ideal pattern”. (3) Expression (communication, sharing) is kinetic, pulling this internal out as “external abstract pattern,” again drawing upon sanctioned or privileged intelligences. Funded in 2004 by SSHRC, some of this on-going *pattern recognition and transformation* research is in conjunction with Mi'kmaq First Nations' Elders in Cape Breton (Unama'ki), Nova Scotia, and science is considered as the “stories of our interactions with and within nature”. This challenging, transdisciplinary and transcultural research attempts to abide by one of the major emergents from SSHRC’s “Dialogue on Research and Aboriginal Peoples” (2002-2003), namely that non-Aboriginal scholars, when working with Aboriginal peoples and/or their knowledges, should “**walk beside or behind, but not attempt to lead**”. Overall, the research approach also strives to meet some suggestions in UNESCO’s report from the 1999 World Conference on Science, subtitled “Science for the 21st Century, a new commitment” (<http://www.unesco.org/science/wcs/>), as well as the 2005 UNESCO world report entitled “Towards Knowledge Societies” (<http://unesdoc.unesco.org/images/0014/001418/141843e.pdf>). In this presentation, I will explain the Integrative Science conceptual framework re *pattern recognition and transformation*, seeking guidance towards my use of “mimesis” (plus alterity, poiesis, and kinesis) within it, bearing in mind the centrality of “creativity and life-affirmation” in many traditional Indigenous knowledges.

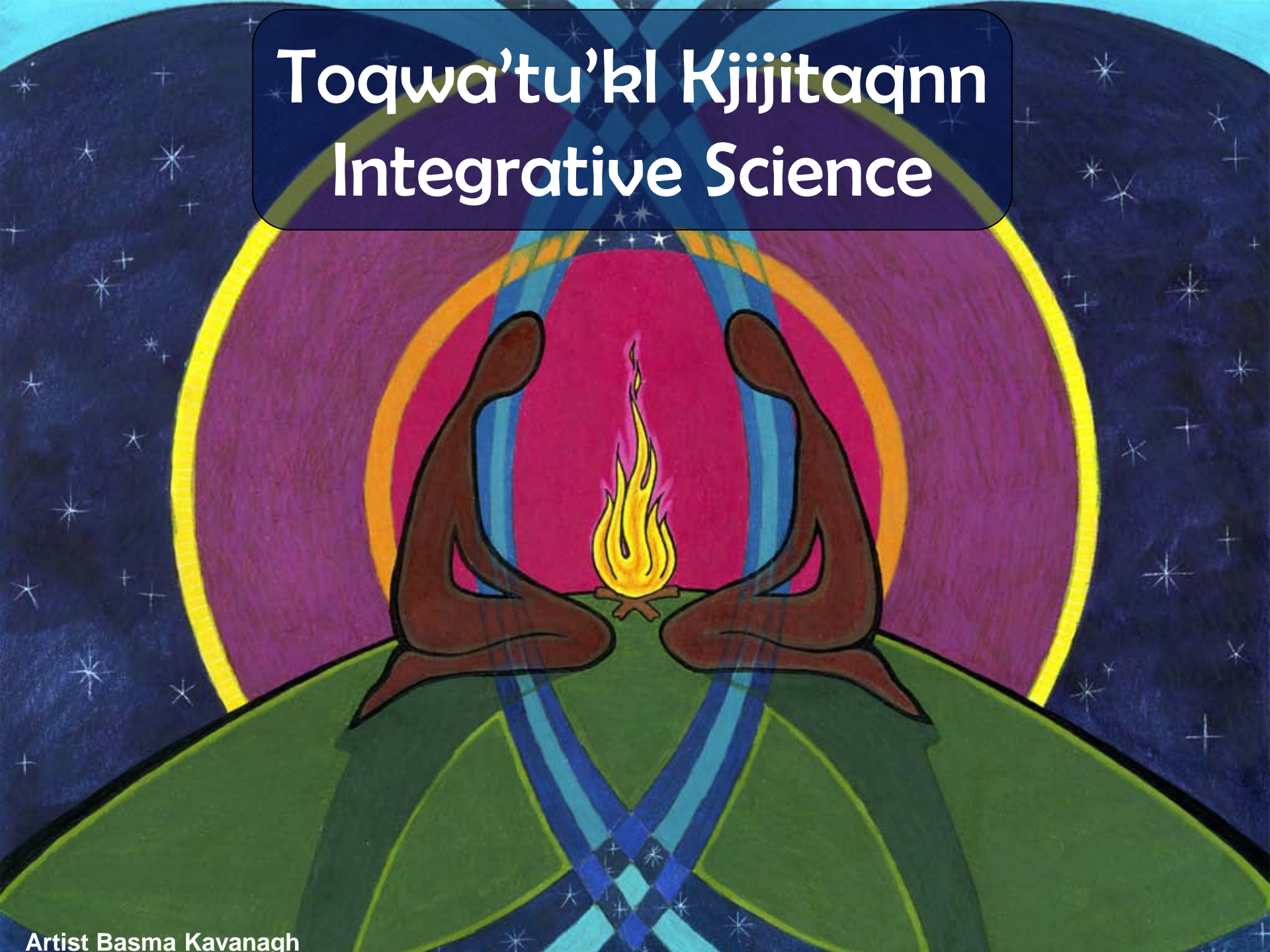
The central dilemma of science education today is the teaching of science from only one cultural perspective, and in an incomplete and non-connected manner.

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

Indigenous

Western

Toqwa'tu'kl Kijitaqnn Integrative Science



Toqwa'tu'kl Kijitaqnn Integrative Science

Indigenous our knowledges Western
our world views

“bringing our stories together”

“two-eyed seeing”

learning to see with the strengths of each & together



Indigenous



Western



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

stories of our interactions with and within nature

Science

PATTERN

recognition & transformation

Periodic Table of the Elements

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 Unquadrium	105 Unp Unpentium	106 Unh Unhexium	107 Uns Unseptium	108 Uno Unoctium	109 Une Unennium	110 Dh Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson									
		72 La Lanthanum	74 Ce Cerium	76 Pr Praseodymium	78 Nd Neodymium	80 Pm Promethium	82 Sm Samarium											83 Eu Europium	84 Gd Gadolinium	85 Tb Terbium	86 Dy Dysprosium	87 Ho Holmium	88 Er Erbium	89 Tm Thulium	90 Yb Ytterbium	91 Lu Lutetium
		88 Ac Actinium	90 Th Thorium	92 Pa Protactinium	94 U Uranium	96 Np Neptunium	98 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

Integrative Science: how?



focus on:

common ground

PATTERN RECOGNITION

Both Indigenous and Western scientific knowledges are based on observations of the environment.

Both result from the same intellectual process of creating **order** out of disorder.

Integrative Science: how?



stories of our interactions
with and within nature

PATTERN

- recognition
- transformation

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

“pattern smarts”

multiple intelligences theory

(H. Gardner, Harvard Univ.)

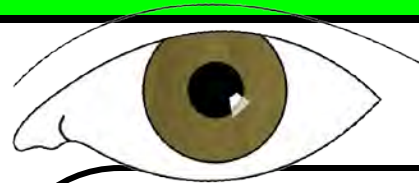
- ◇ numbers (logical-mathematical)
- ◇ language (linguistic)
- ◇ music (musical)
- ◇ body (body-kinesthetic)
- ◇ spatial (spatial)
- ◇ other people (interpersonal) [inter-being]
- ◇ self (intrapersonal)
- ◇ naturalist (naturalist)
- ◇ spiritual / existential *

use?

VALUE

‘sanctioned’

“two-eyed seeing” our sanctioned ‘pattern smarts’



- logical - mathematical
- linguistic
- musical
- body - kinesthetic
- spatial
- interpersonal / being
- intrapersonal
- naturalist
- spiritual / existential*

vigour

- **logical-
mathematical**
- linguistic
- naturalist

rigour

weaving

resonance

construction

un-weaving

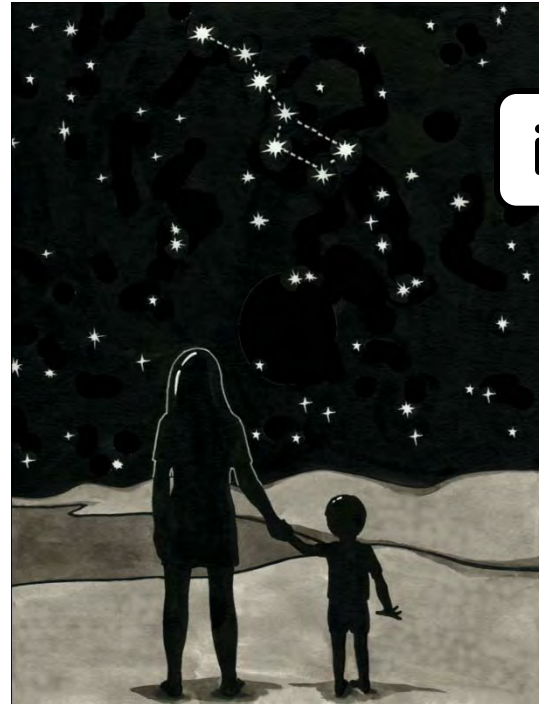
“two-eyed seeing” our sanctioned worlds



animate



inanimate



Artist Basma Kavanagh

“two-eyed seeing”
how we converse with our worlds



subject-subject



subject-object

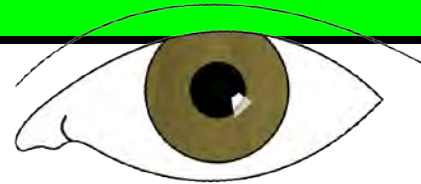
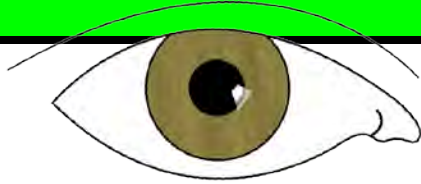
mimesis



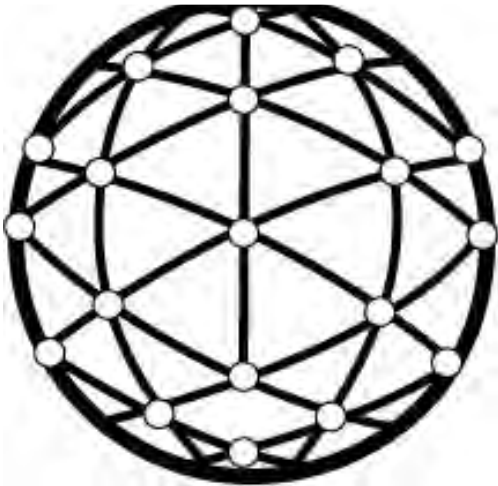
alterity



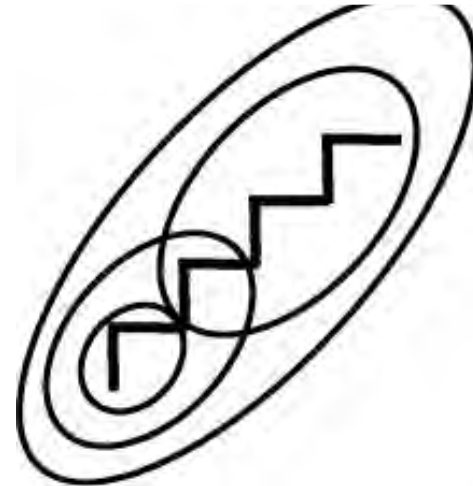
“two-eyed seeing”
how our world is



interconnected

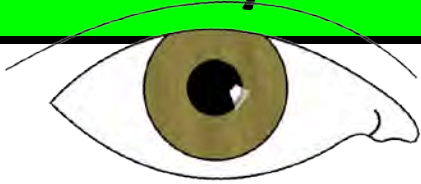


parts & wholes

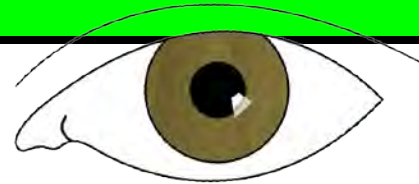


“two-eyed seeing”

our key concepts & actions

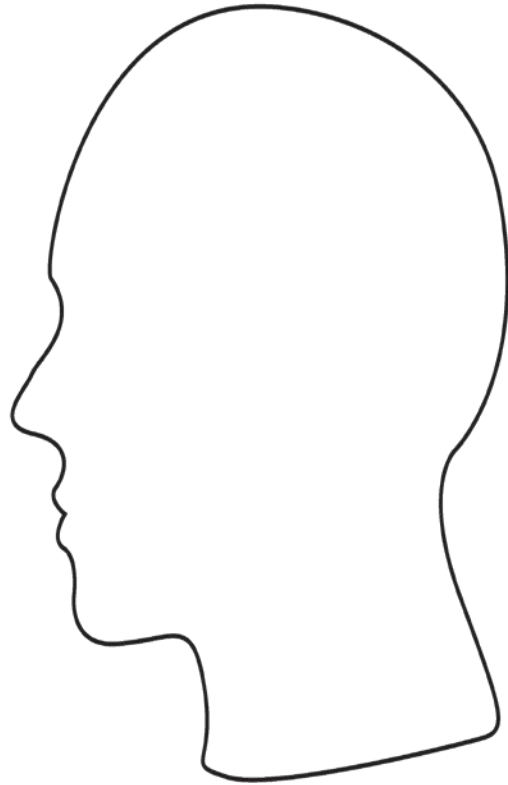


- **respect**
- **relationship**
- **reverence**
- **reciprocity**
- **ritual**
- **repetition**
- **responsibility**



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

PATTERN CONCEPTUAL FRAMEWORK



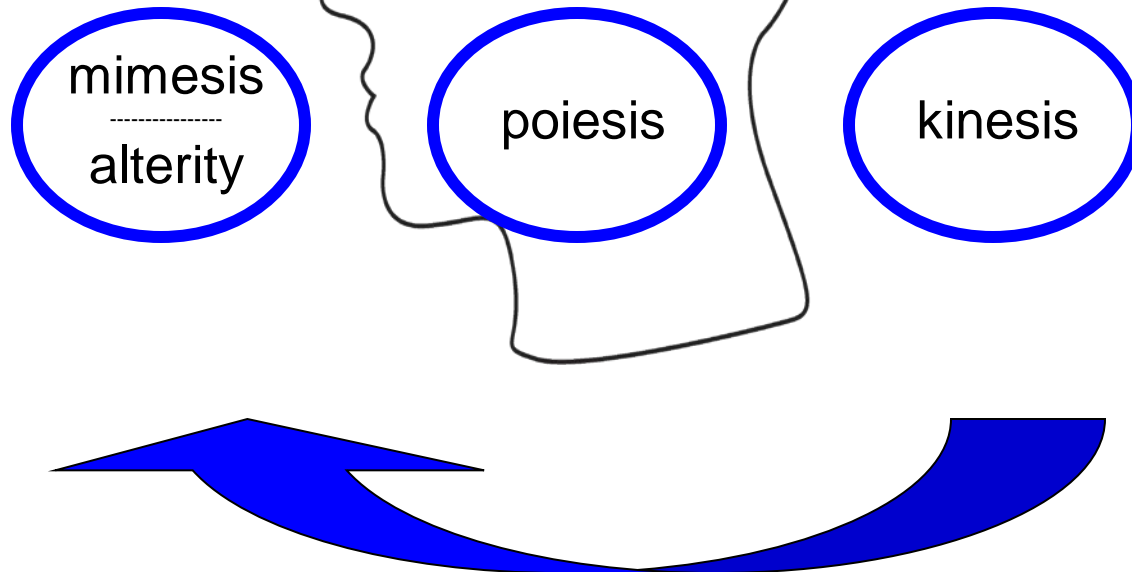
three piece iterative approach

PATTERN CONCEPTUAL FRAMEWORK

outer

inner

outer



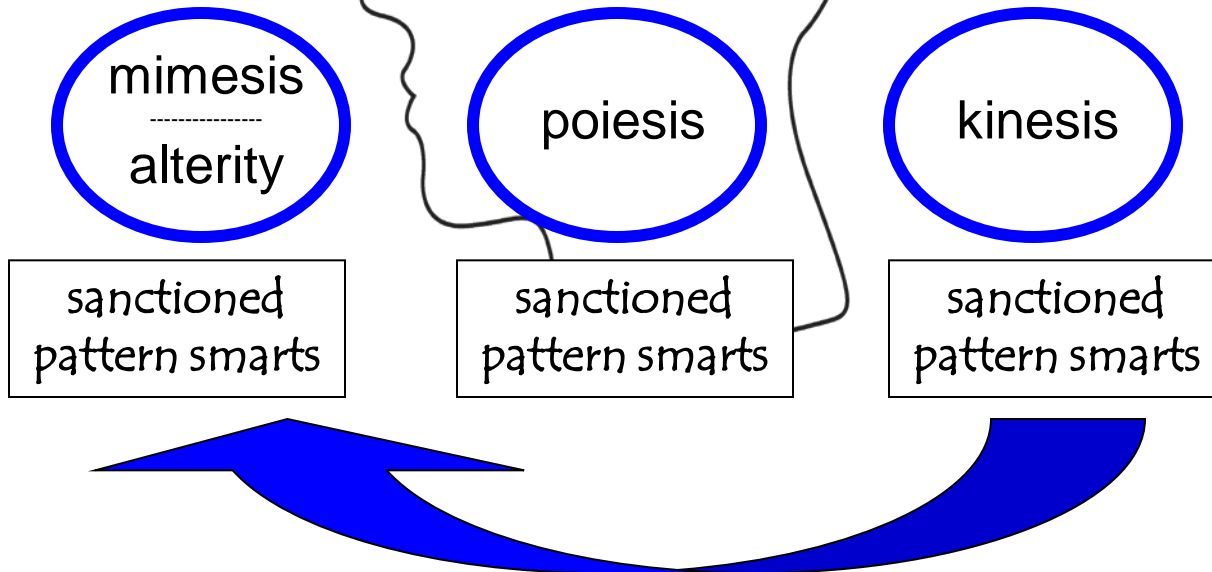
three piece iterative approach

PATTERN CONCEPTUAL FRAMEWORK

outer

inner

outer



three piece iterative approach

PATTERN CONCEPTUAL FRAMEWORK

natural

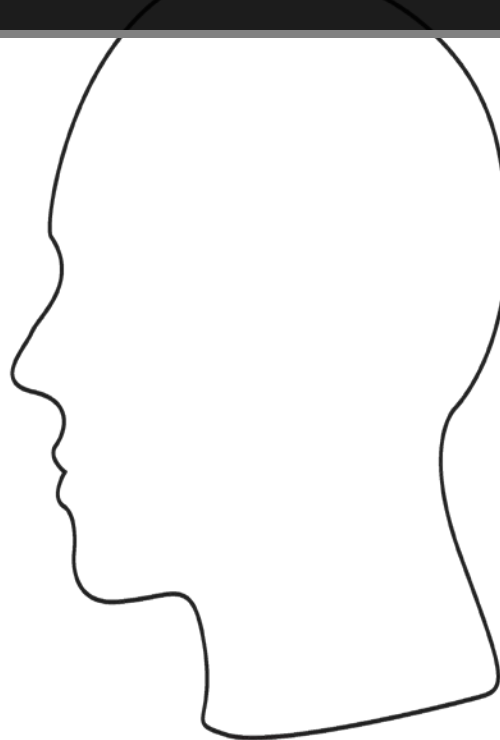
ideal

abstract

outer

inner

outer



mimesis

alterity

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

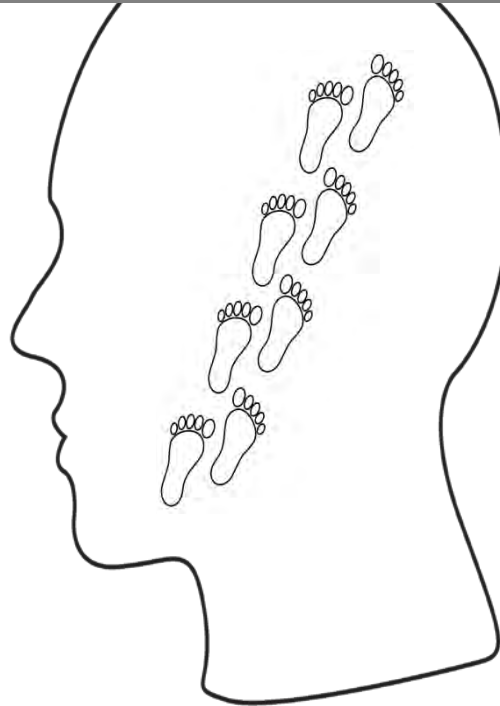
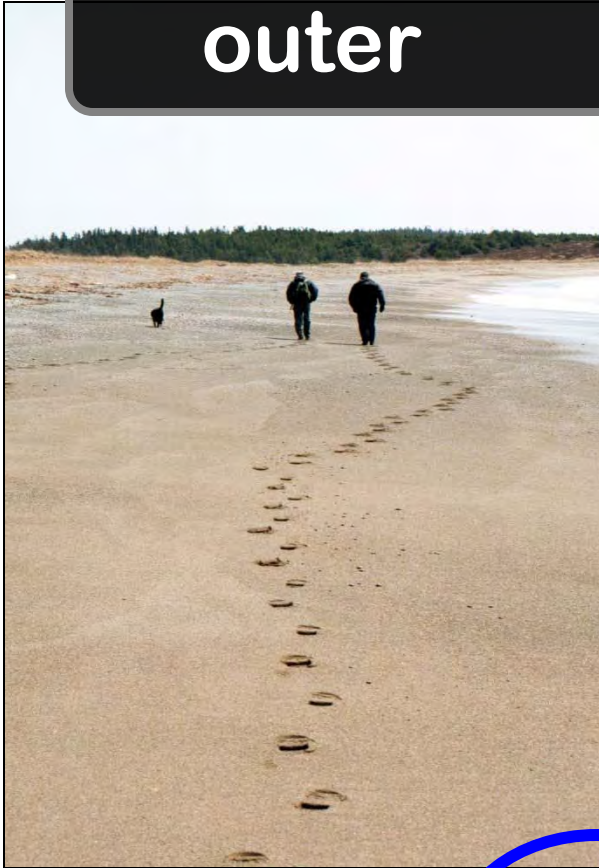
ideal

abstract

outer

inner

outer



mimesis

alterity

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

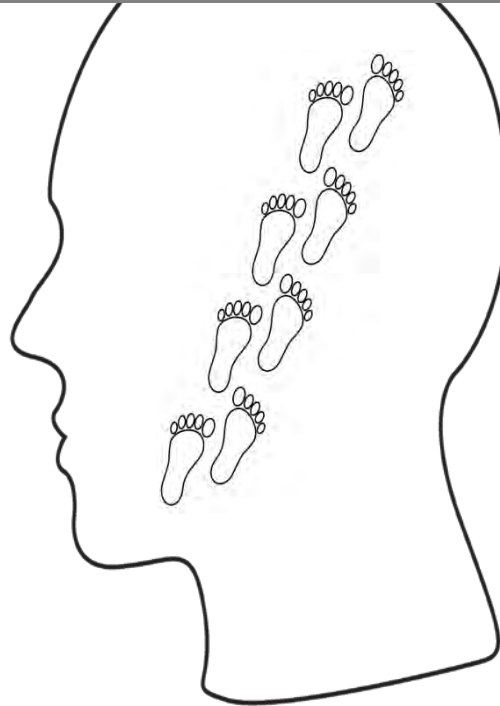
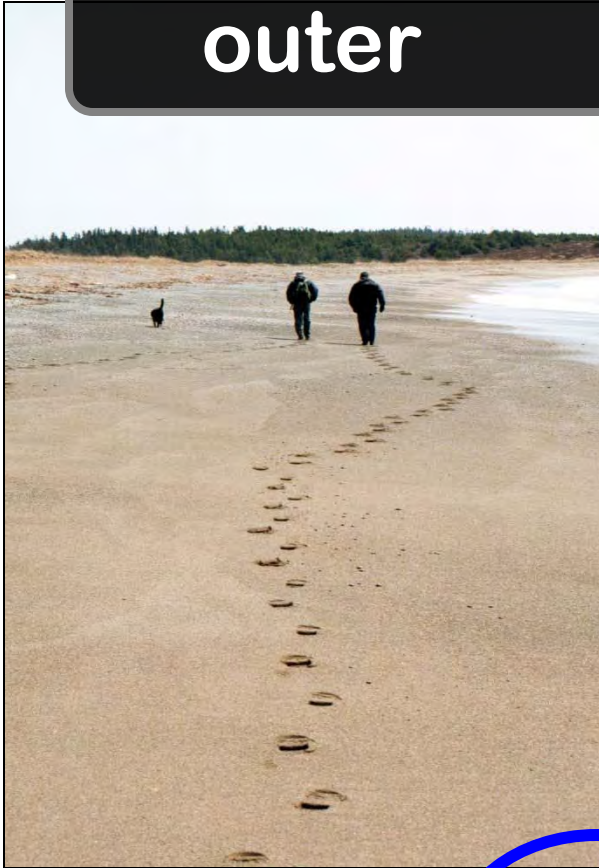
ideal

abstract

outer

inner

outer



mimesis

alterity

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

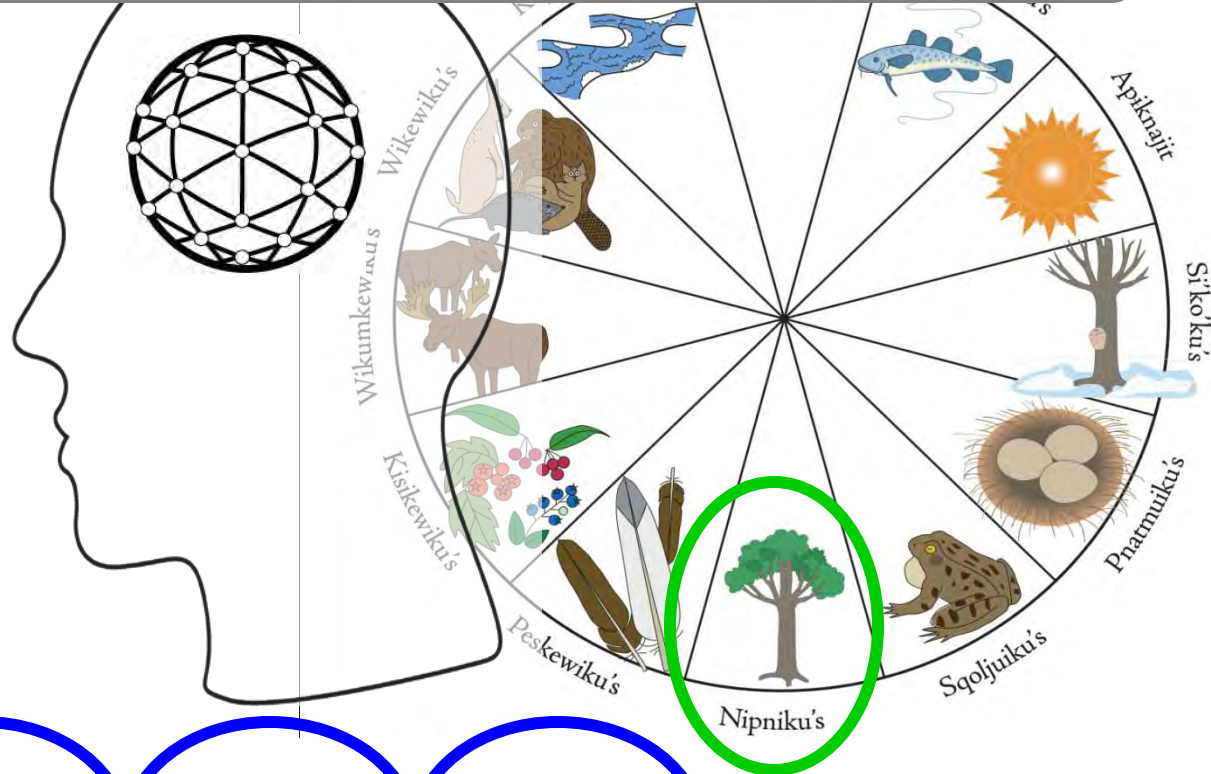
ideal

abstract

outer

inner

outer



mimesis

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

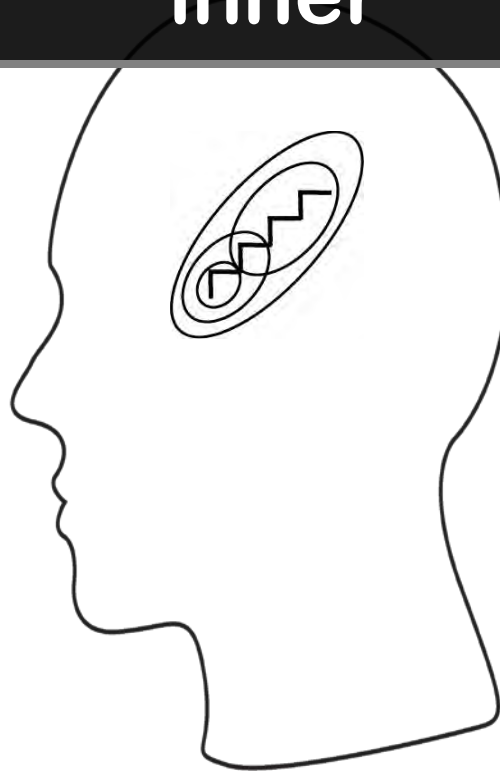
ideal

abstract

outer

inner

outer



June

alterity

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

ideal

abstract

outer

inner

outer



1000



?

Attu'tuejualu

*Achillea
millefolium*

Yarrow

mimesis

alterity

poiesis

kinesis

PATTERN CONCEPTUAL FRAMEWORK

natural

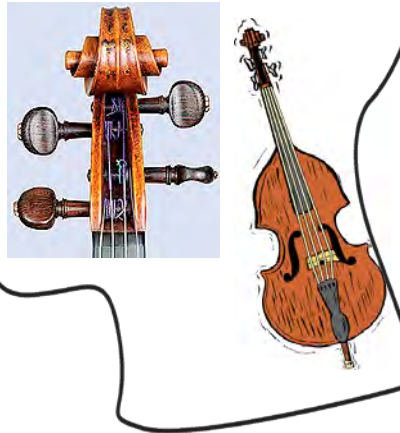
ideal

abstract

outer

inner

outer



Mtèskmwaqsil

Fiddlehead
fern

mimesis

alterity

poiesis

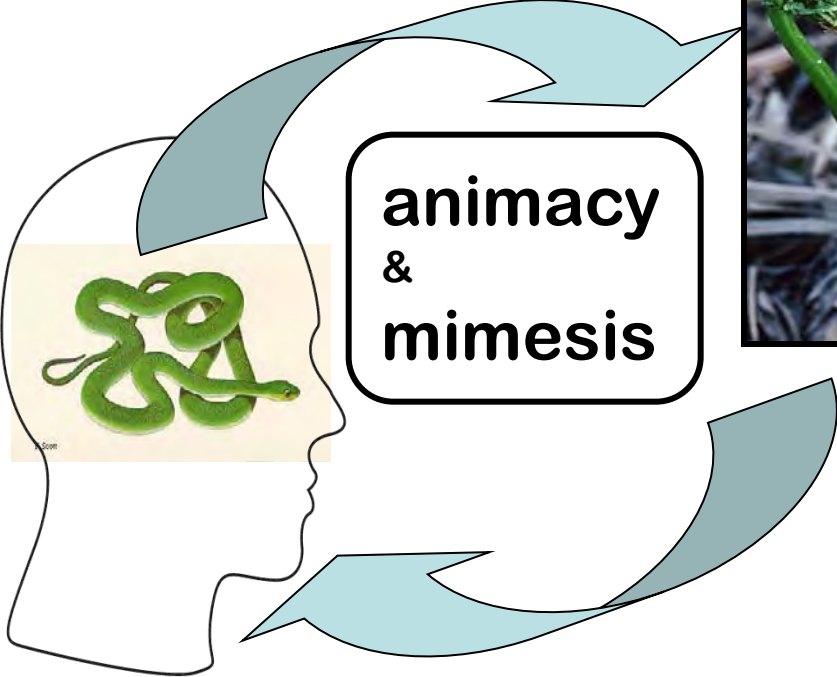
kinesis

what our "seeing" (re)generates

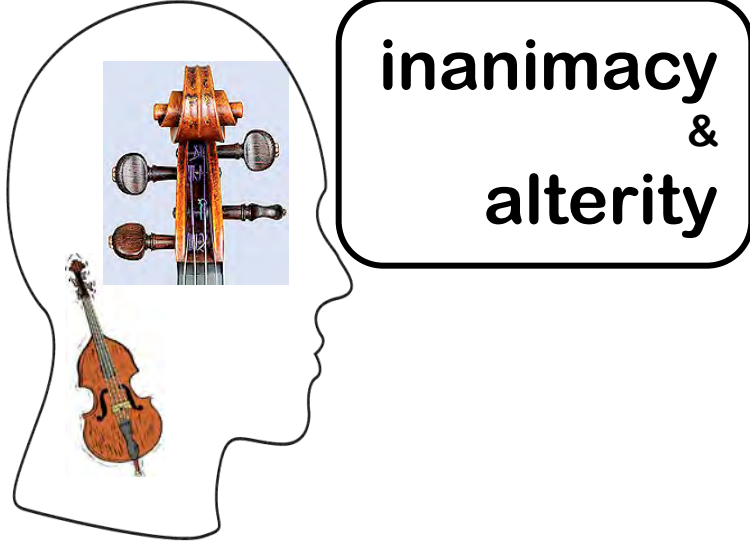


subject-subject

subject - object



**animacy
&
mimesis**

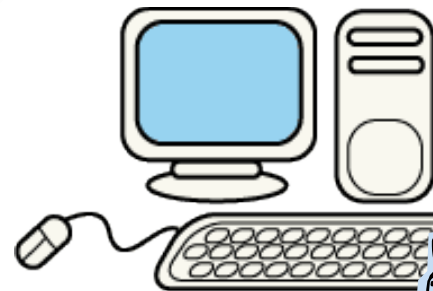
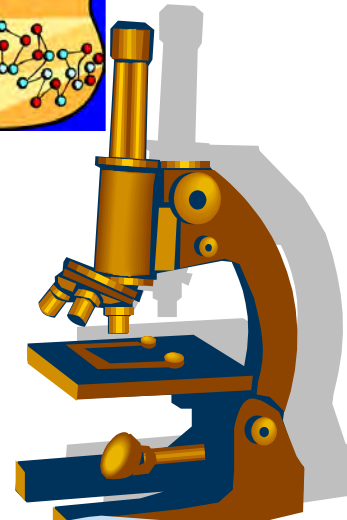
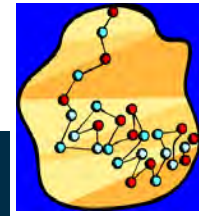


**inanimacy
&
alterity**

connectedness

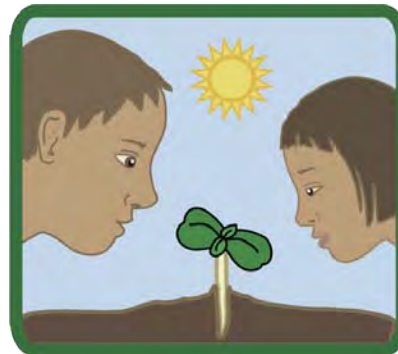
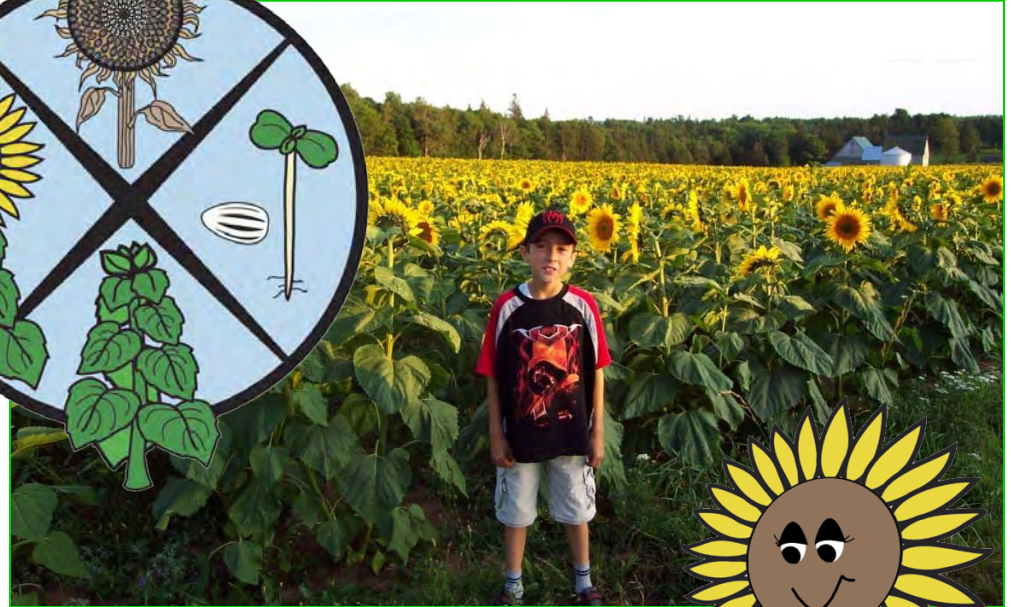
disconnectedness

what we "see" as: MENTAL HEALTH

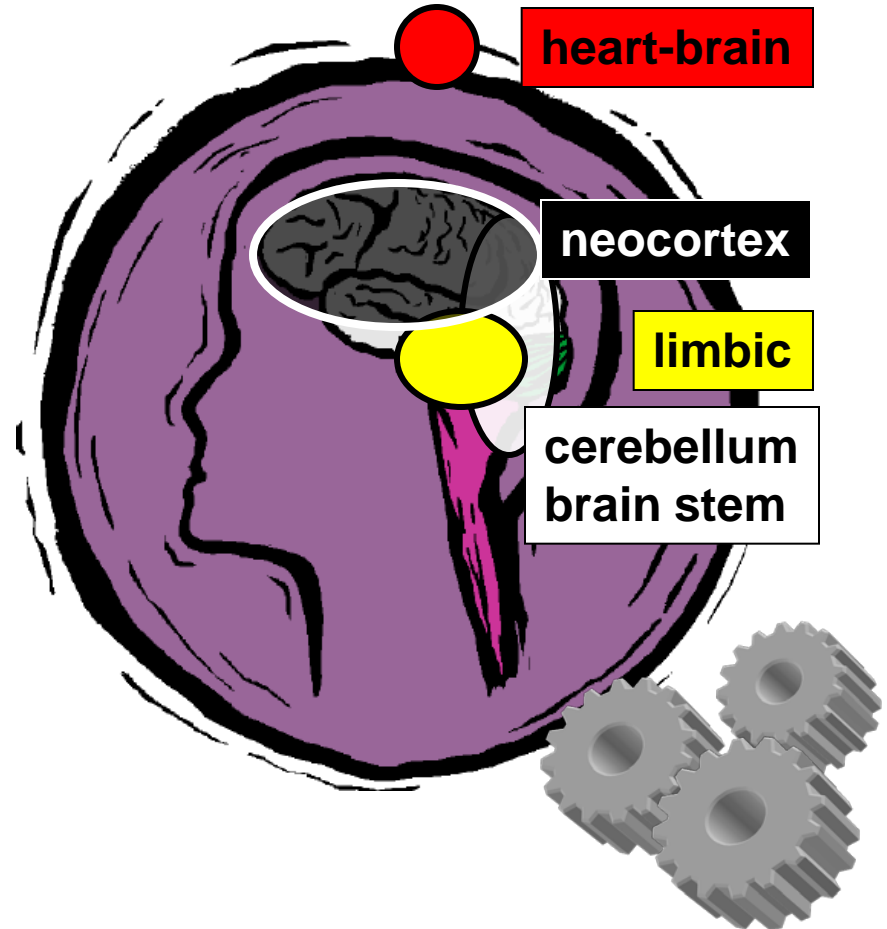
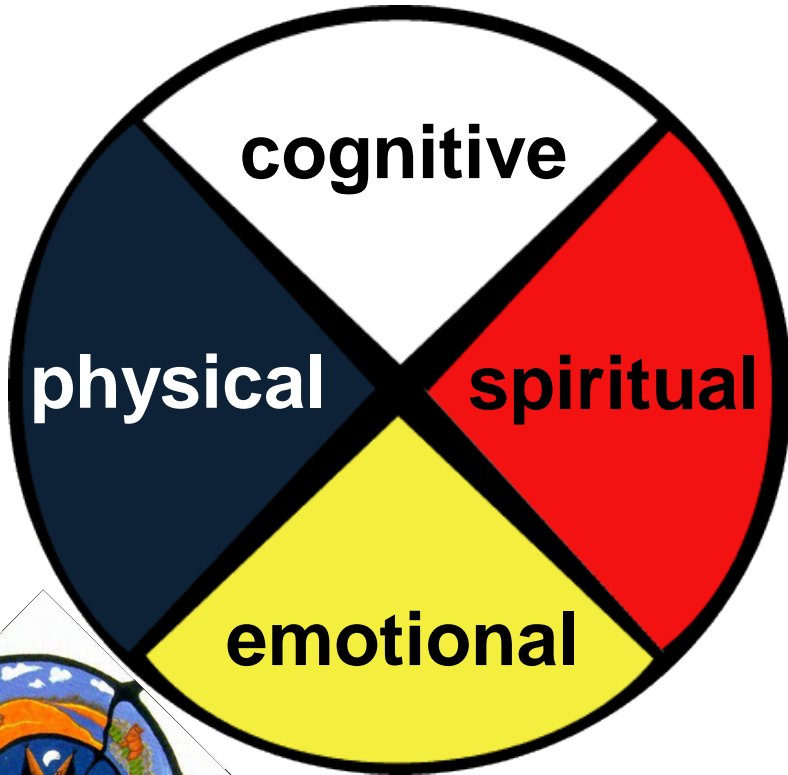


Artist: Rod Restoule
from: Into the Daylight;
C. Morriseau, 1998

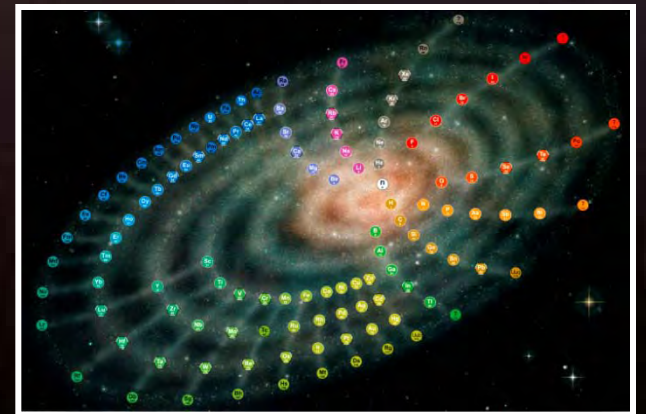
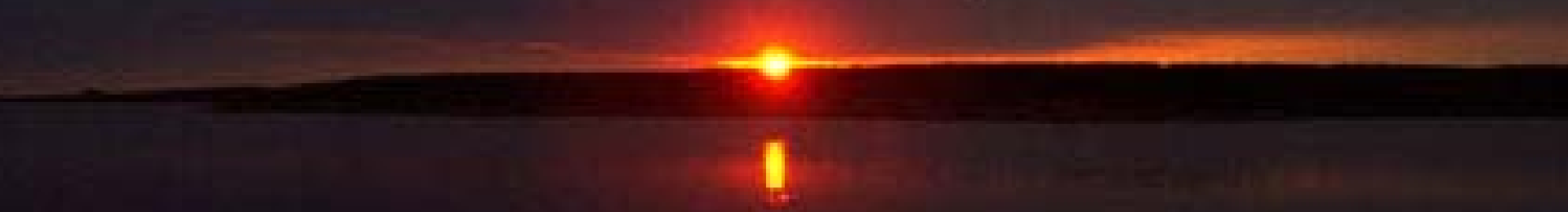
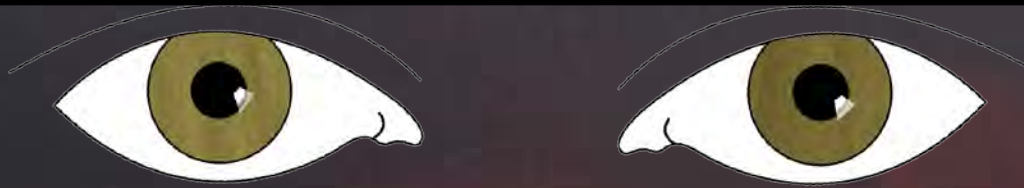
healthy young ... need TLC



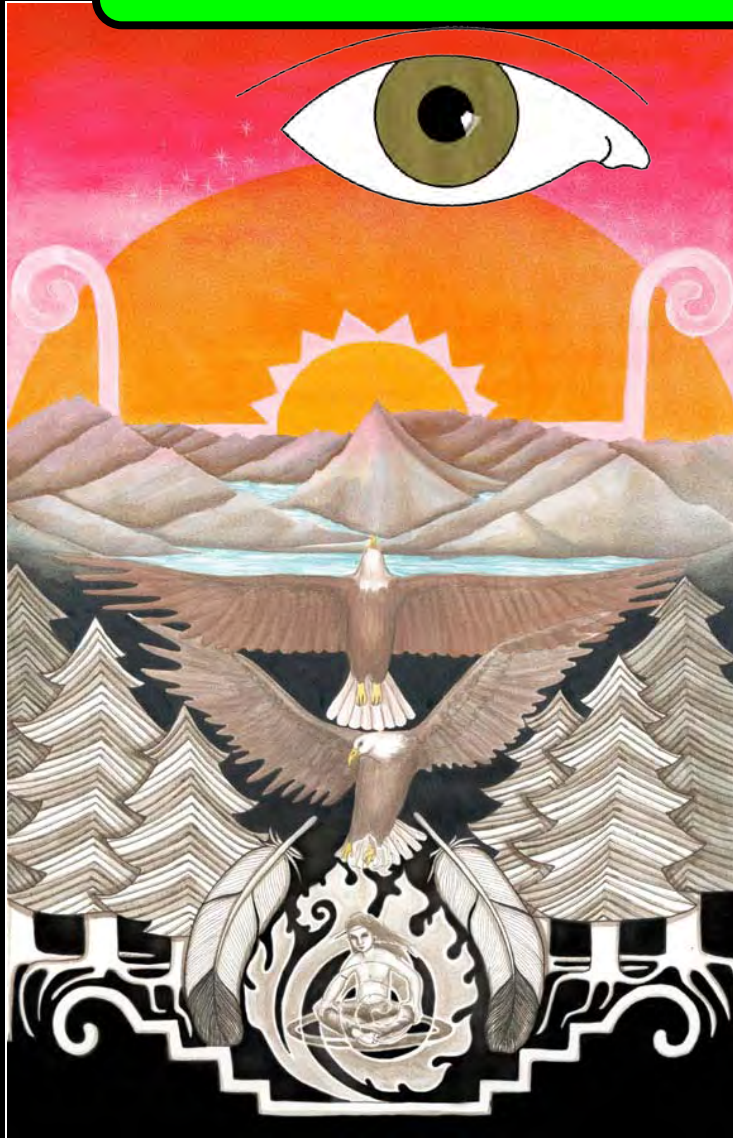
what we "see" as: HUMAN



what we "see" as: SUN



what we "see" as: SUNRISE



o, o,
Location: W060 11, N46 09

SYDNEY, NS
Rise and Set for the Sun for 2004
Zone: 4h West of Greenwich

Astronomical Applications Dept.
U. S. Naval Observatory
Washington, DC 20392-5420

Day	Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
01	0743	1625	0724	1705	0659	1748	0540	1830	0447	1910	0413	1945	0413	1956	0443	1930	0522	1839	0600	1740	0642	1644	0723	1617
02	0743	1626	0723	1706	0657	1749	0538	1831	0445	1911	0412	1946	0414	1955	0444	1929	0523	1837	0601	1738	0644	1644	0724	1616
03	0743	1627	0722	1708	0655	1750	0536	1833	0444	1912	0412	1947	0415	1955	0446	1925	0524	1835	0602	1736	0645	1642	0725	1616
04	0743	1628	0720	1709	0654	1752	0534	1834	0442	1913	0411	1947	0415	1955	0447	1926	0525	1833	0604	1734	0646	1642	0727	1616
05	0743	1629	0719	1711	0652	1753	0532	1835	0441	1915	0411	1948	0416	1954	0448	1925	0527	1831	0605	1732	0648	1640	0728	1615
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26	0731	1656	0646	1742	0551	1822	0455	1903	0417	1939	0411	1956	0436	1938	0514	1850	0553	1750	0634	1655	0717	1619	0742	1621
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31	0725	1703			0542	1829			0413	1944			0442	1931	0520	1840			0641	1647			0743	1625

Artist Basma Kavanagh

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.**

Artist Basma Kavanagh



Canada Research
Chairs

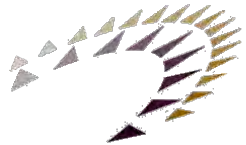
Chaires de recherche
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Thank you



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