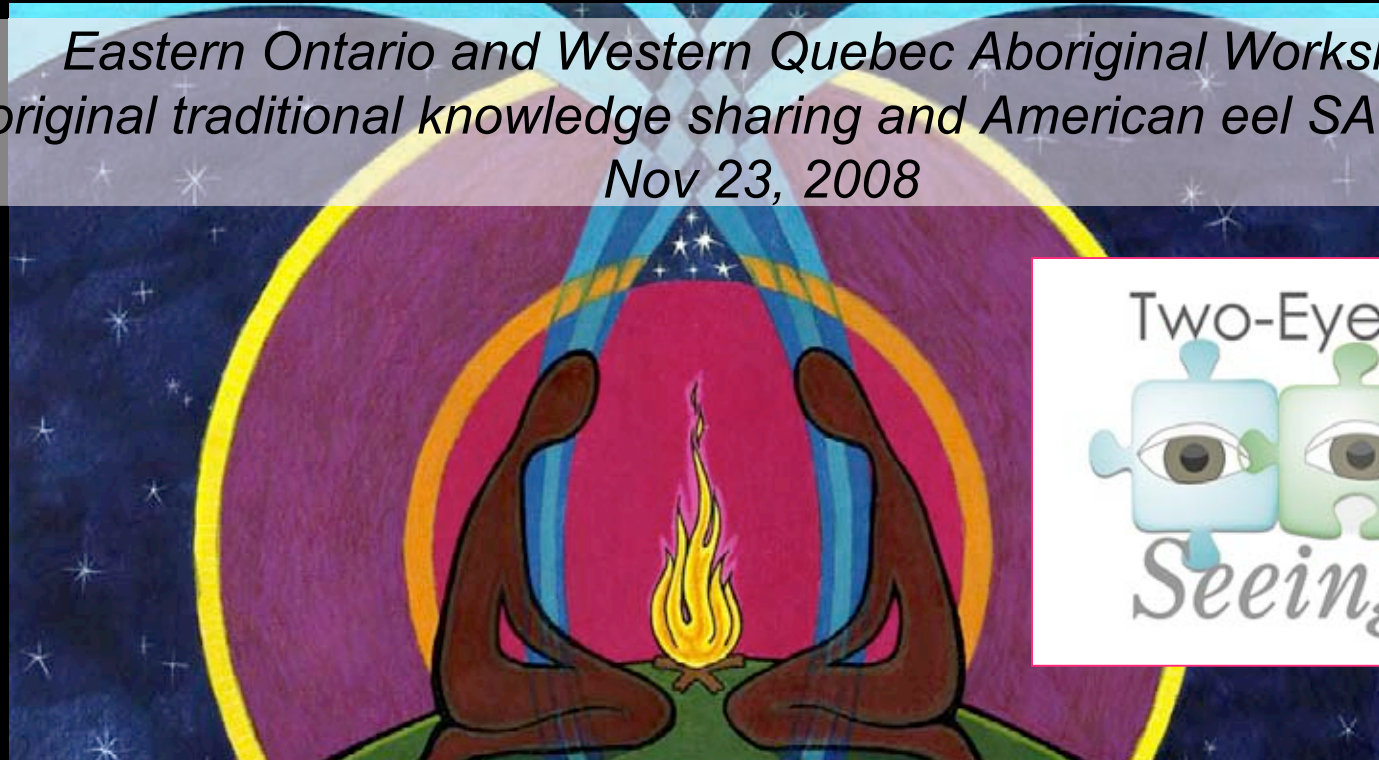


Integrative Science & Two-Eyed Seeing

*Eastern Ontario and Western Quebec Aboriginal Workshop
Aboriginal traditional knowledge sharing and American eel SARA listing
Nov 23, 2008*



Sana Kavanagh BSc MES (in progress)

Research Associate, Institute for Integrative Science and Health
Cape Breton University, Sydney, Nova Scotia

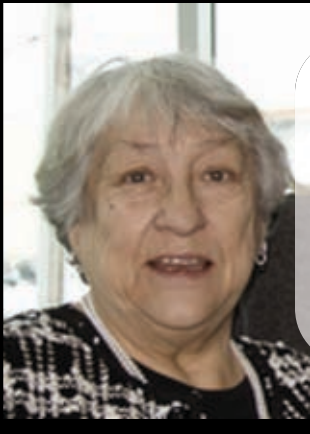
For more information about Integrative Science contact:
cheryl_bartlett@cbu.ca





Cheryl M. Bartlett, PhD

Canada Research Chair in Integrative Science
Professor of Biology, Cape Breton University
Sydney, Nova Scotia



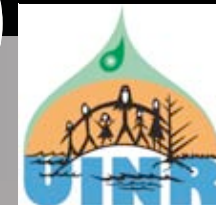
Murdena Marshall, MEd

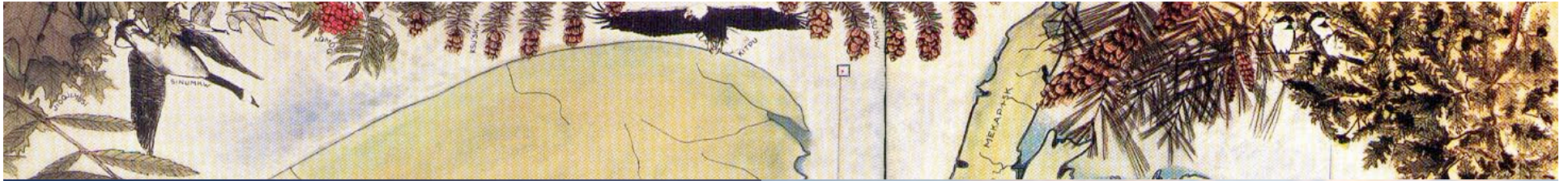
Mi'kmaq Elder, Eskasoni First Nation
Elder Advisor, Institute for Integrative Science and Health
Professor Mi'kmaq Studies (retired), Cape Breton University



Albert Marshall

Mi'kmaq Elder, Eskasoni First Nation
Elder Advisor, Institute for Integrative Science and Health
Unama'ki Institute of Natural Resources





CAPE BRETON UNIVERSITY





LESSONS LEARNED

over 12+ years



LESSONS LEARNED

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





Two-Eyed Seeing

Two-Eyed



a guiding principle
for working together



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



Two-Eyed Seeing

“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.”

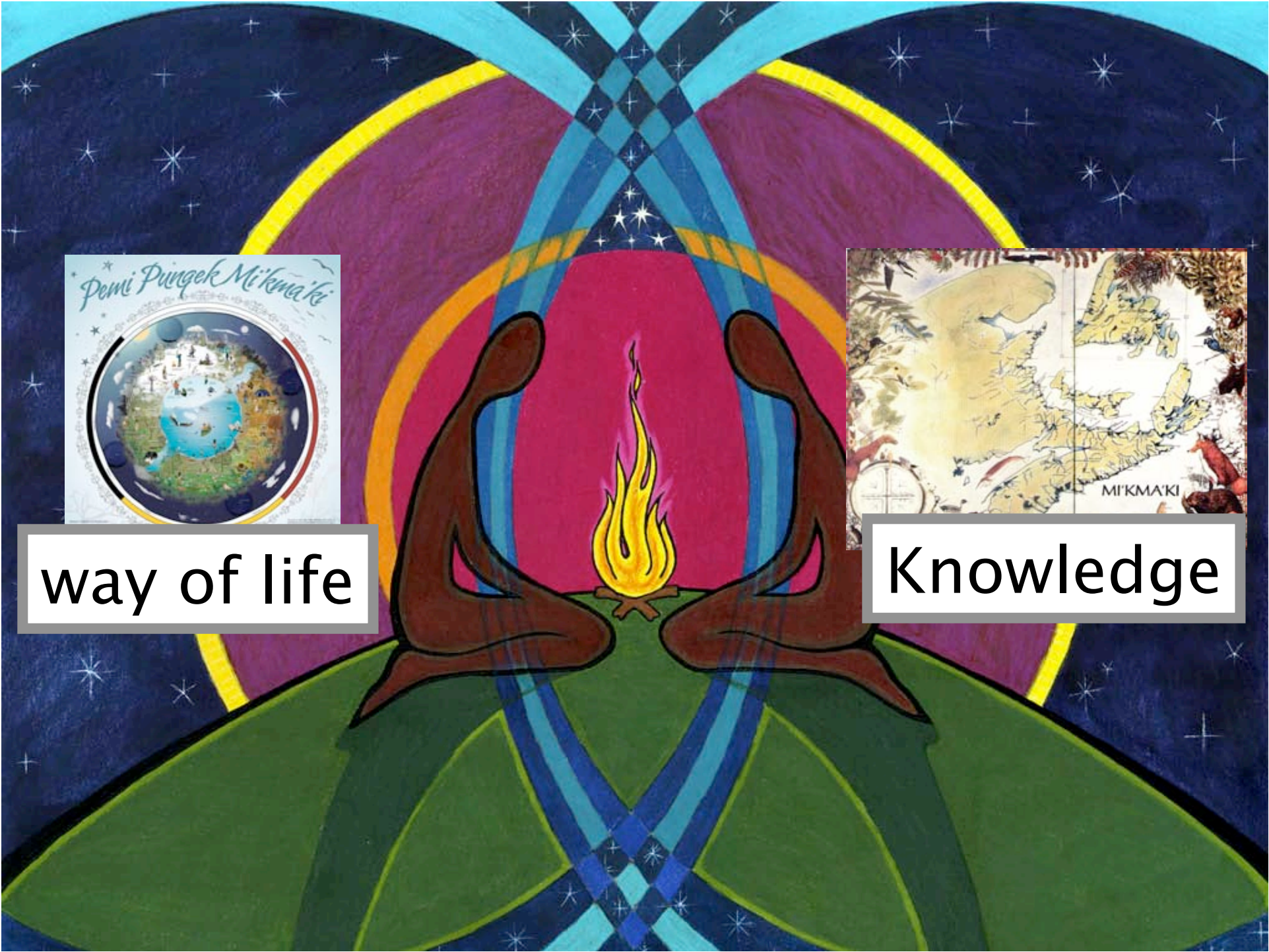




Two-Eyed Seeing

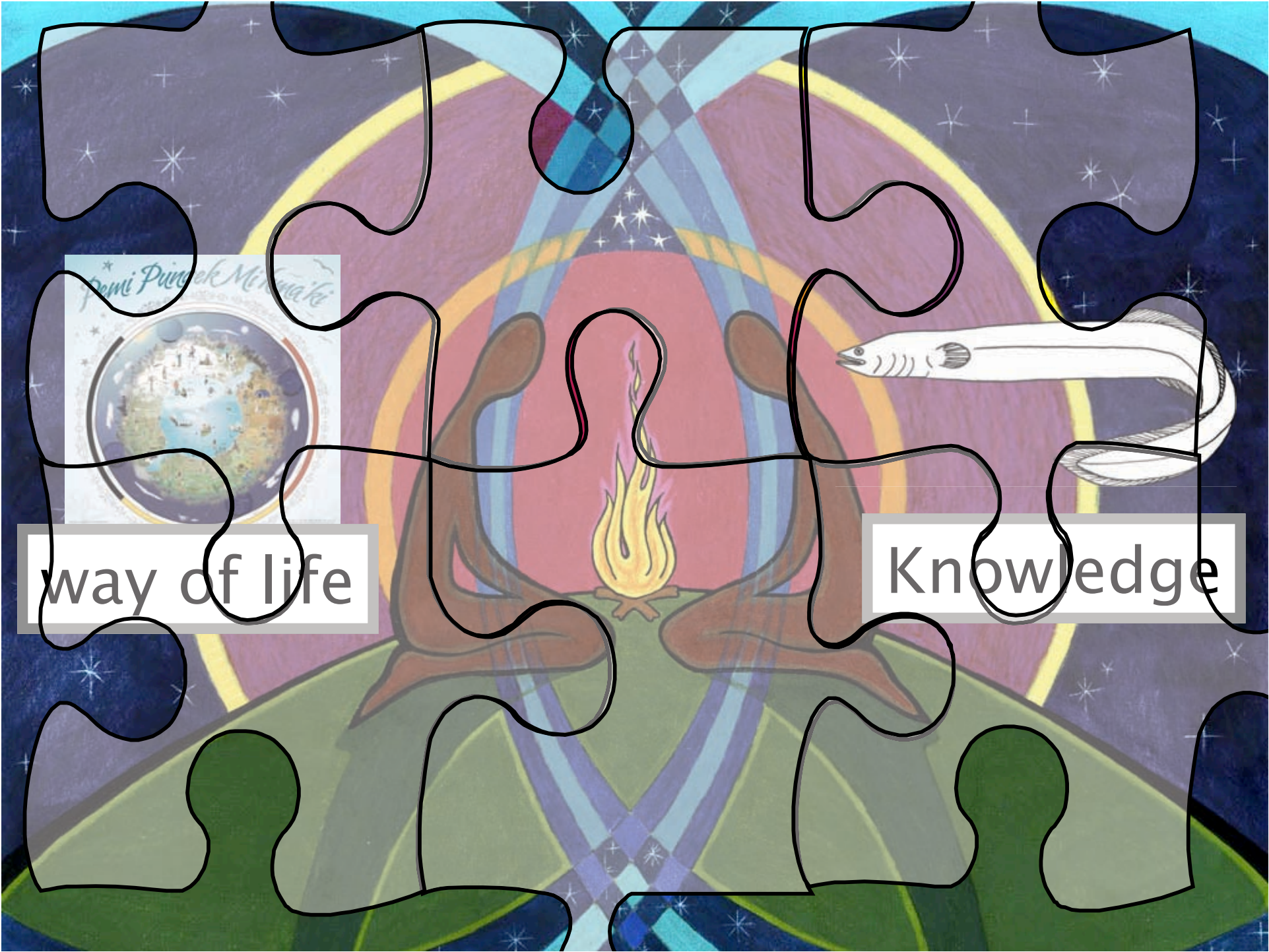
“LEARN ... to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western (or Eurocentric or mainstream) knowledges and ways of knowing ... and to use both these eyes together, for the benefit of all.”





way of life

Knowledge



way of life

Knowledge

LESSONS LEARNED

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

view "SCIENCE"
inclusively

stories of our interactions with and within nature



Science is
dynamic,
pattern-based
knowledge.

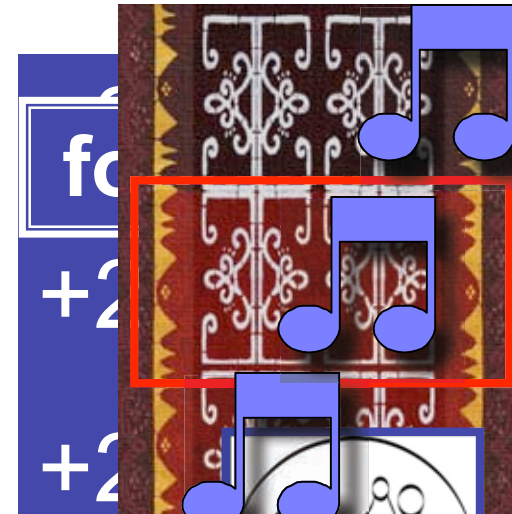
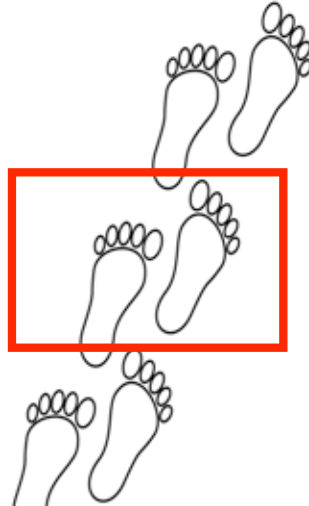
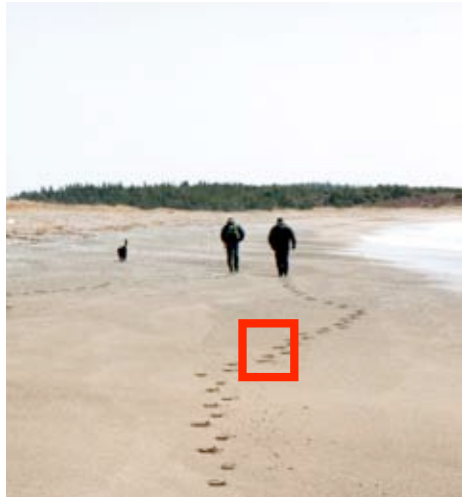


PATTERN CONCEPTUAL FRAMEWORK

natural

ideal

abstract

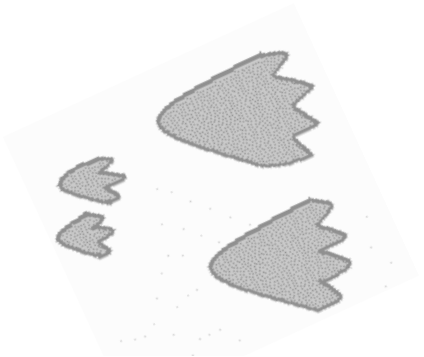
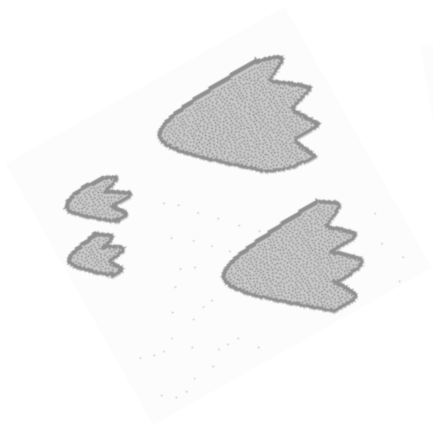
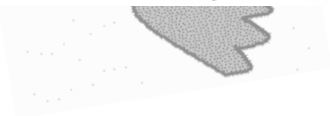
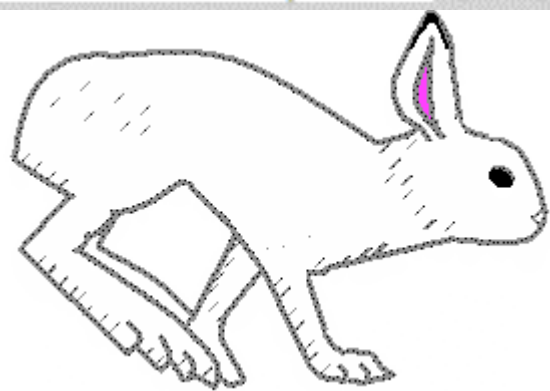
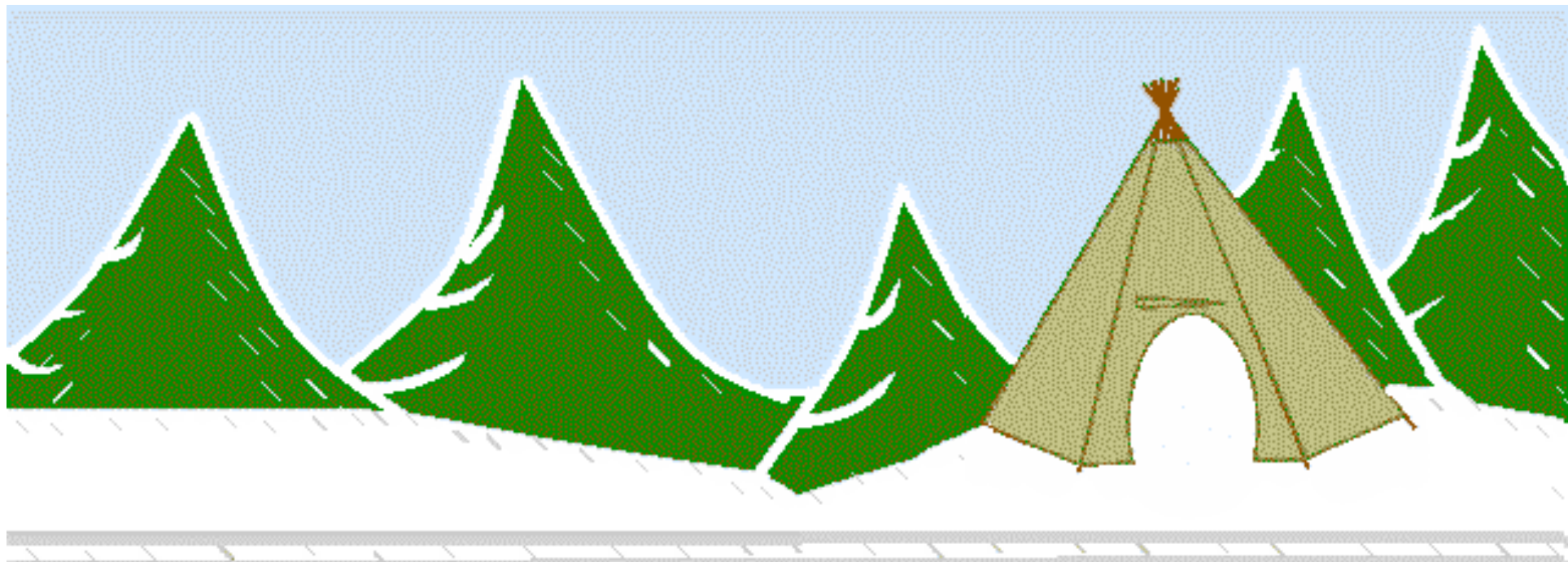


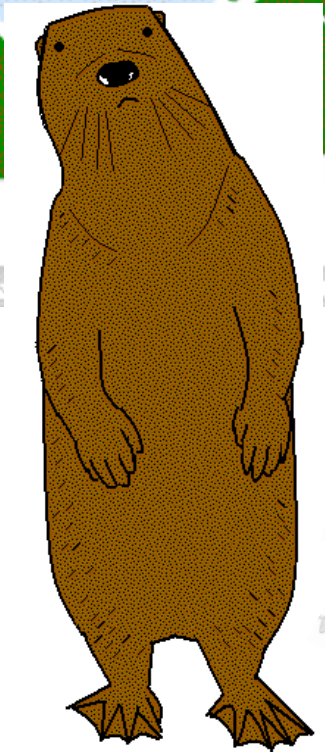
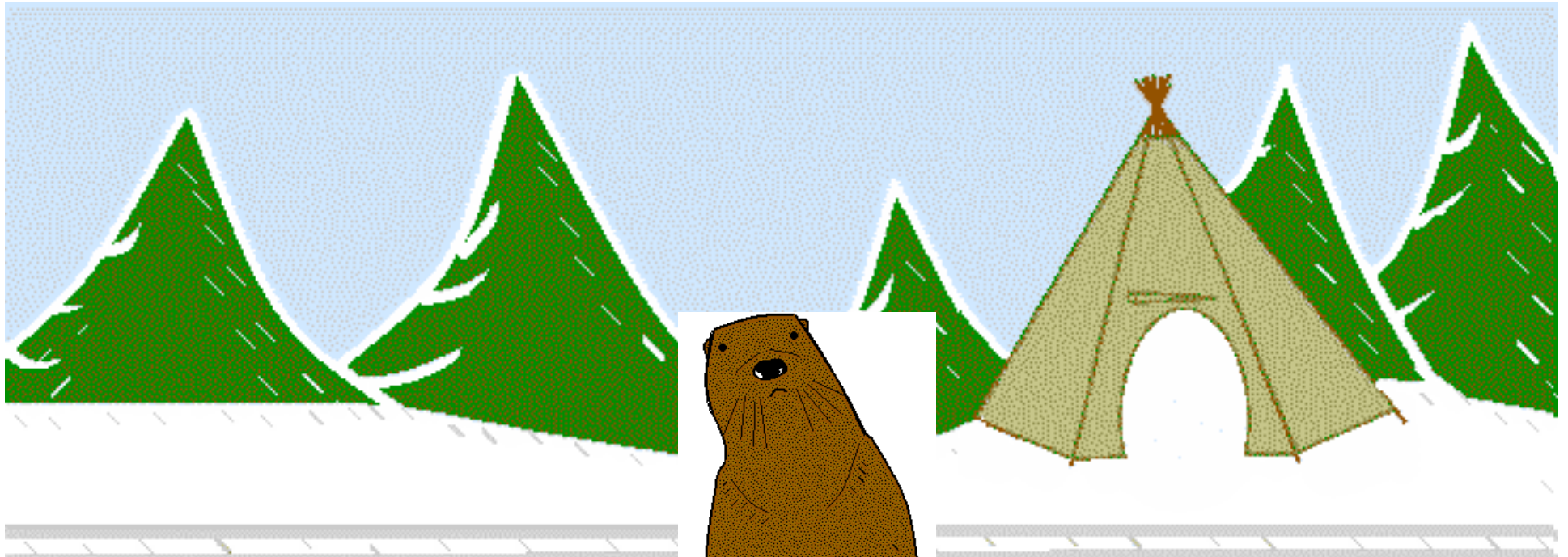
recognize
pattern

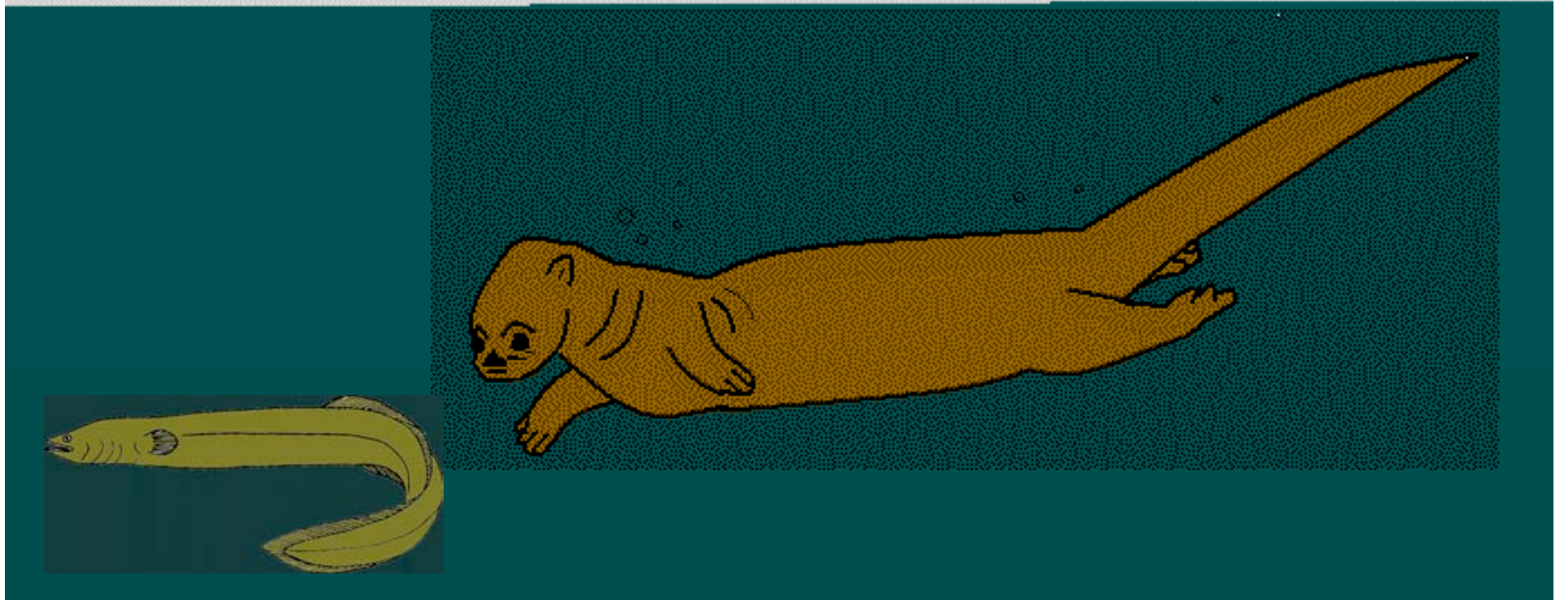
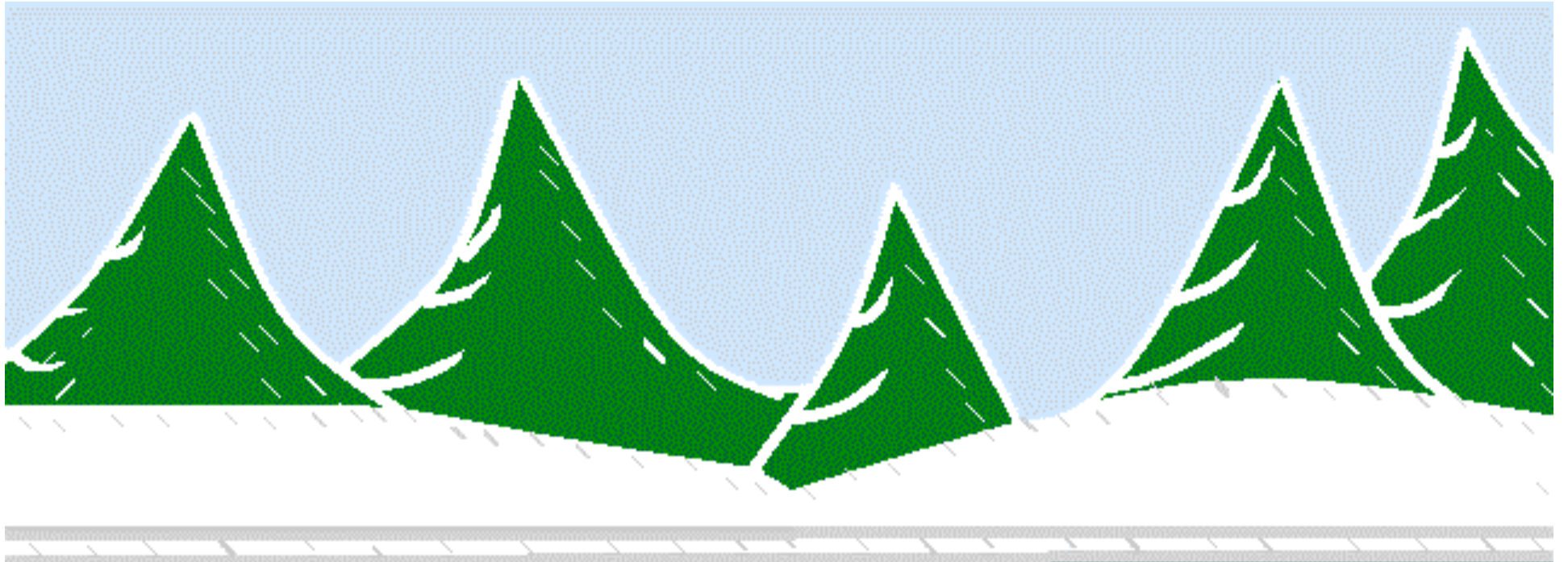
transform
pattern

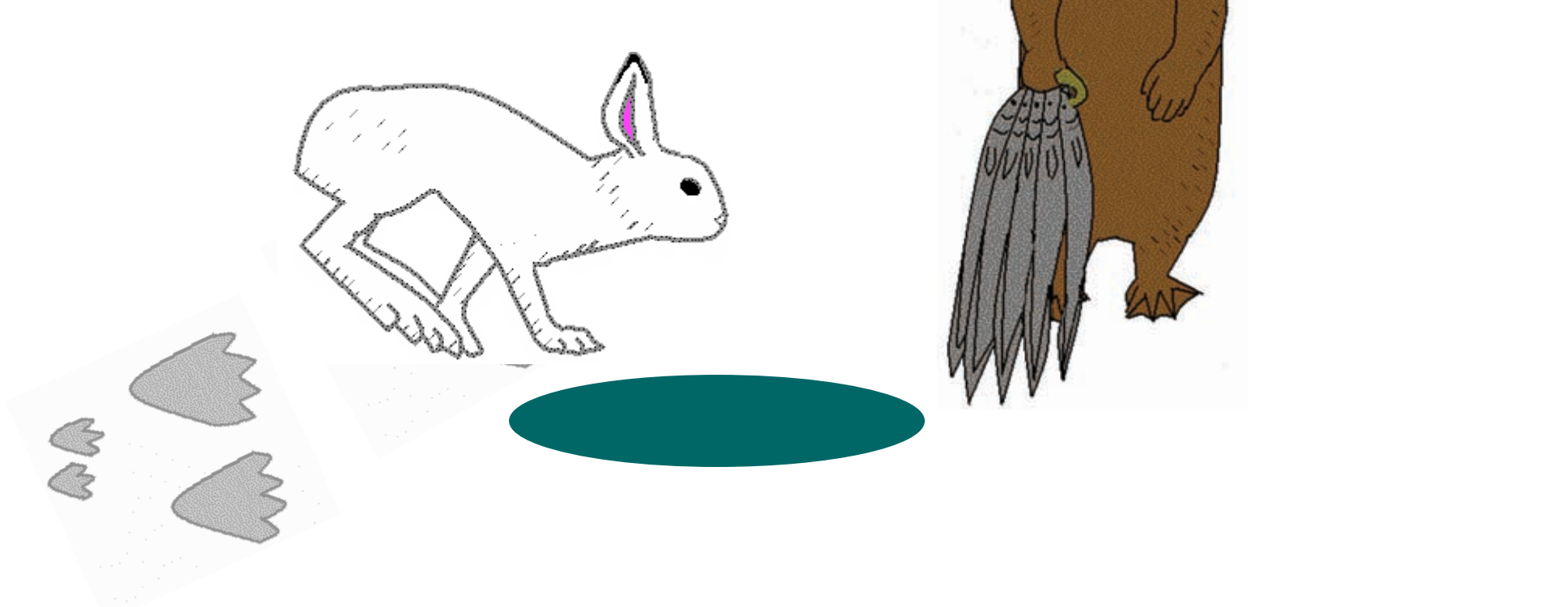
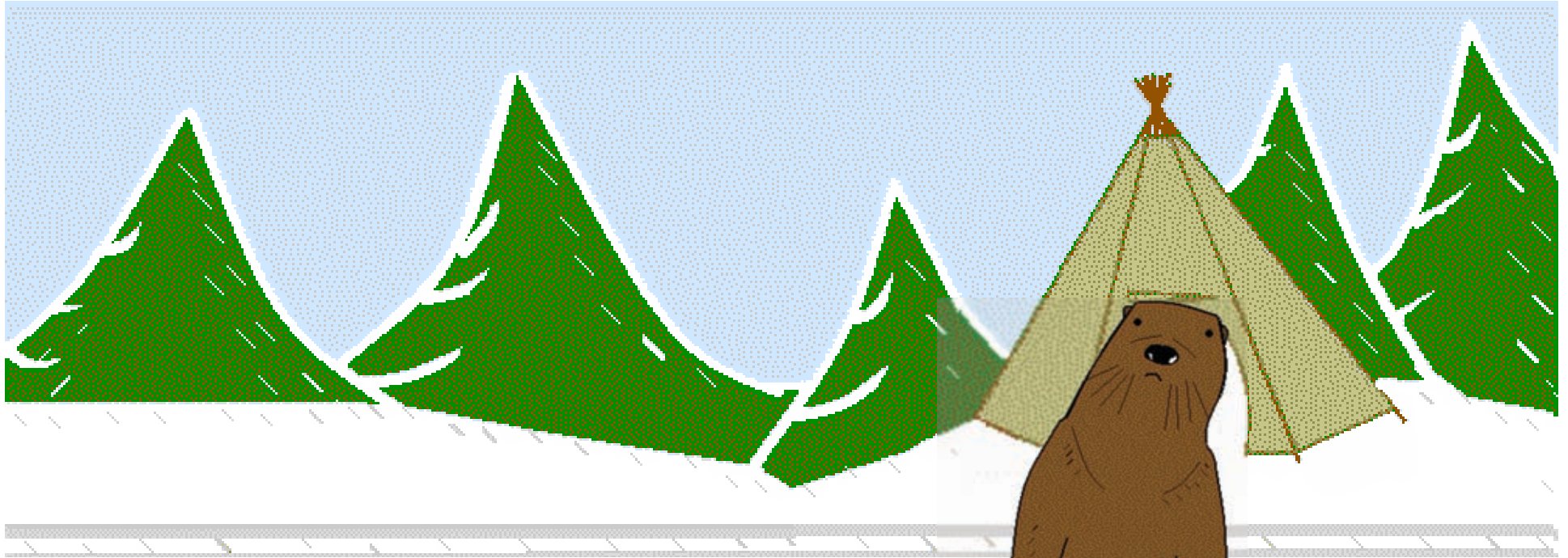
express
pattern





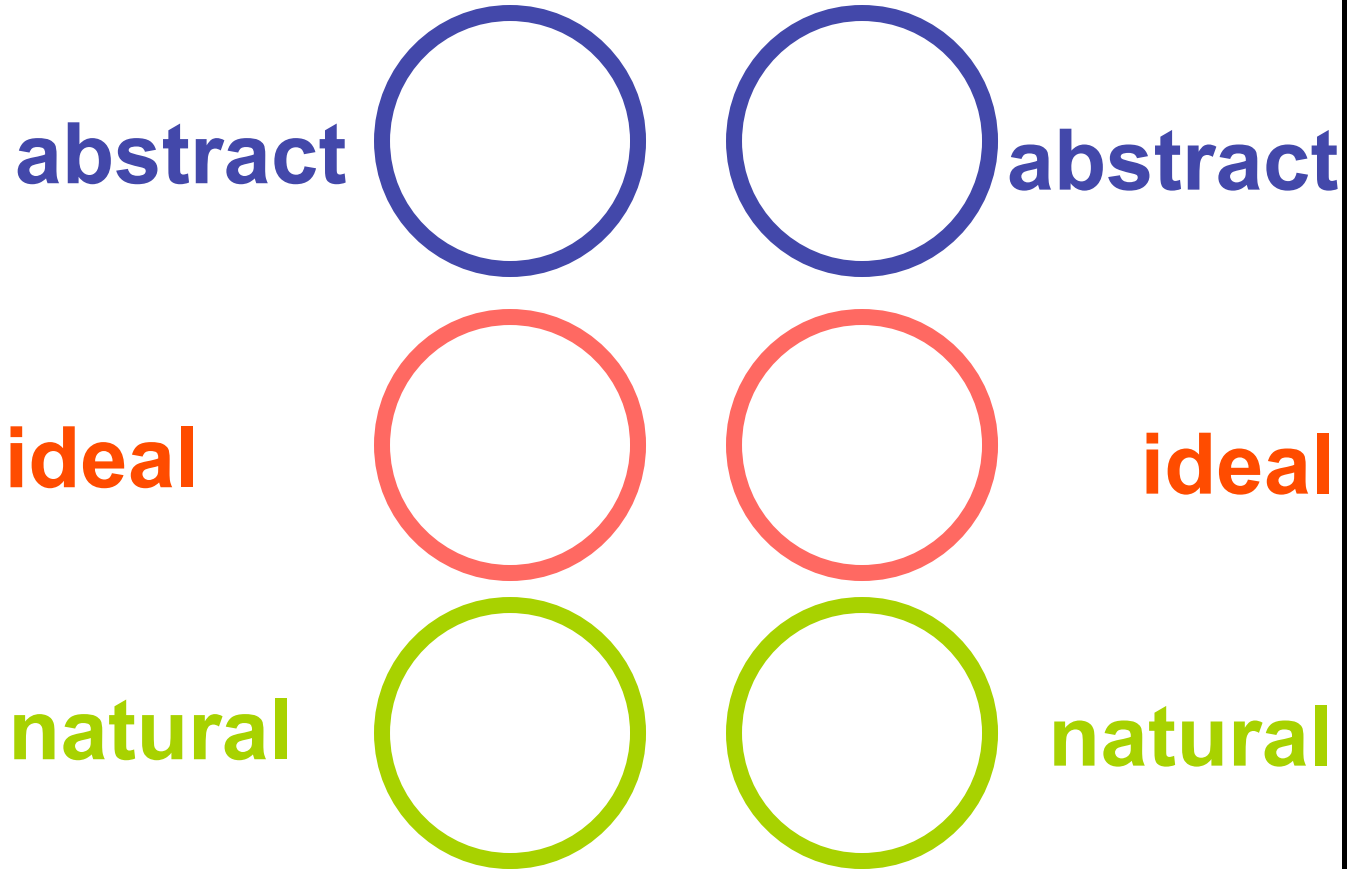








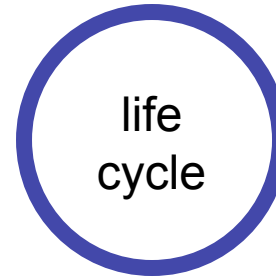
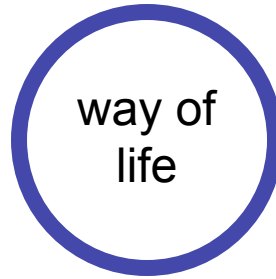
Pattern Conceptual Framework





Pattern Conceptual Framework

abstract



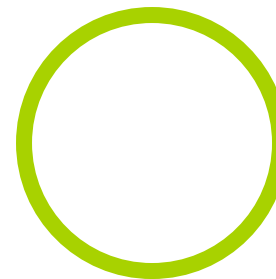
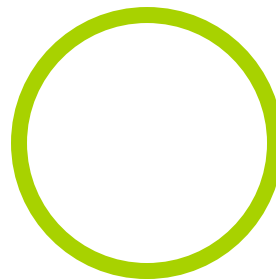
abstract

ideal



ideal

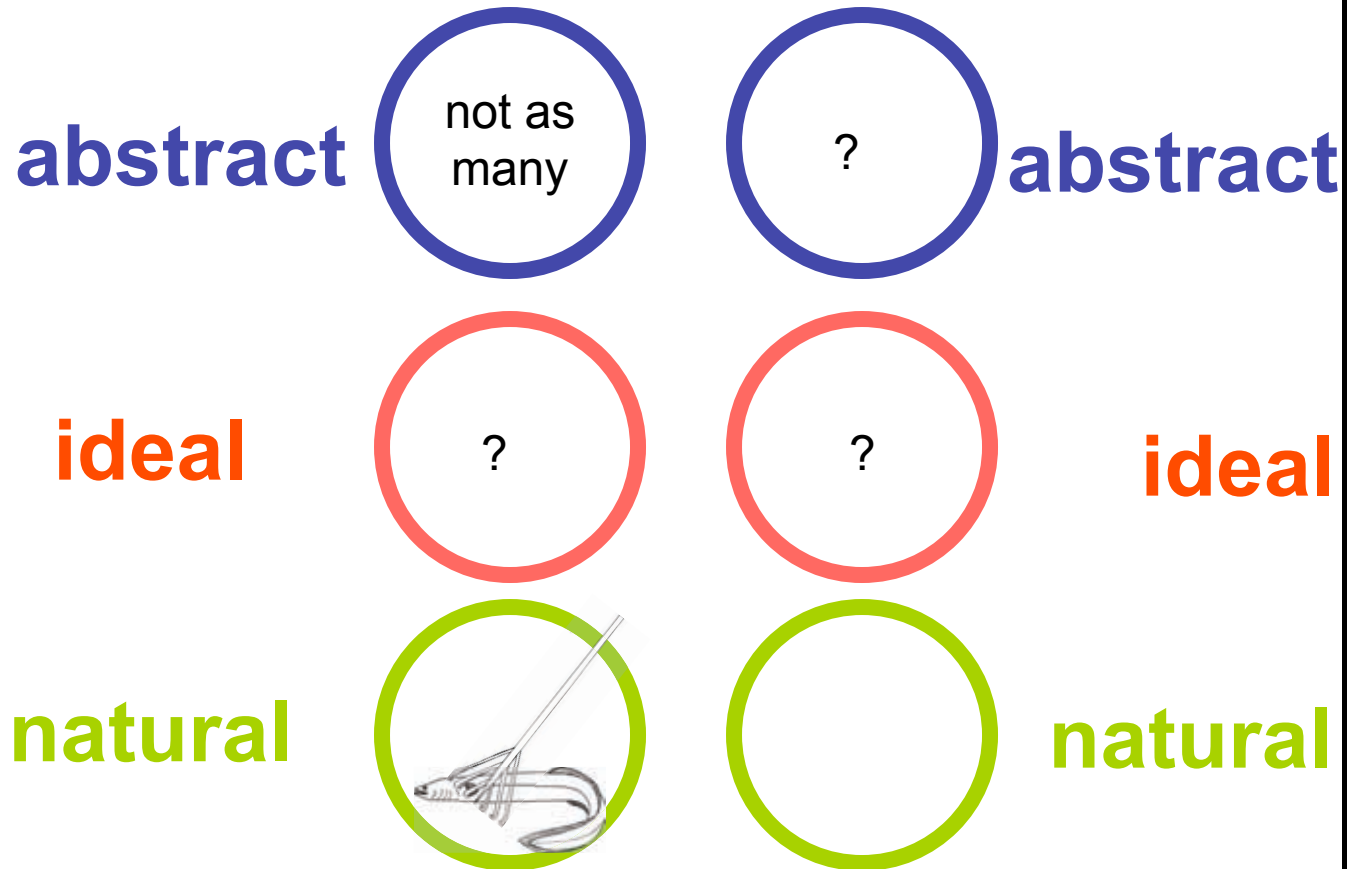
natural



natural



Pattern Conceptual Framework



LESSONS LEARNED

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

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

view "SCIENCE"
inclusively



Co-learning



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)

Picturing Human Health and the Environment: First Steps ... from "Co-Learning Journey" to "Two-Eyed Seeing"

Sana Kavanagh¹, Cheryl Bartlett², Nadine Lefort³, Mardena Marshall⁴, & Alton Marshall⁵

This poster shows how visuals helped facilitate discussion among university researchers, health and environmental professionals, and Mi'kmaq community members about Mother Earth and her lessons for humans about health, healing and wholeness in an Aboriginal community based, participatory action research project based on Cape Breton Island, Nova Scotia.

Visually work, we concluded that visuals can help a group to reach:

- a shared understanding of how to talk together
- a shared vision of how to work together
- a shared understanding of terms and concepts

Project Title

Imaginative Health and Healing - co-learning our way to expanding wholeness through reconnection of relationships with the land

Starting Point

- Spiritual connections with the land can be so limited and developed as a positive option within health and healing practices in modern Mi'kmaq communities
- Cultural understandings about common ground and differences between Aboriginal and Western thinking can be shared such that these understandings can facilitate new health options for Mi'kmaq communities as well as foster research partnerships

Goals

- Establish a research partnership with Mi'kmaq community input, participation, and guidance
- Create a new path of mutual trust and mutual respect between university researchers, health and environmental professionals, and Mi'kmaq communities
- Co-learn about traditional knowledge that can promote improved health, particularly among young people in Mi'kmaq communities

Co-Learning Approach

- Our Co-Learning Approach involved:
 - Learning together
 - Learning from each other
 - Learning the common
 - Learning the difference

Guiding Wisdom

Our Co-Learning Approach was guided by the following wisdom:
Go into a forest, you see the birch, maple, pine. Look underground and all these trees are holding hands. We as people need to do the same.
Sana Kavanagh, Cheryl Bartlett, Nadine Lefort, Mardena Marshall, Alton Marshall



Co-Learning Journey

A shared understanding of how to talk together

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



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



Example

Two-Eyed Seeing

A shared vision of how to work together

Two-Eyed Seeing is a vision of how to work together which was one of the new understandings that emerged during the *Imaginative Health and Healing* project. Two-Eyed Seeing is learning to use both our eyes with the strengths of Aboriginal knowledge, and from the other eye with the strengths of Western knowledge, and to use both these eyes together for the benefit of all. Thus, Two-Eyed Seeing intentionally and respectfully brings together our different ways of knowing to envision people, Aboriginal and non-Aboriginal alike, to work together.

Creating a visual for Two-Eyed Seeing has helped us share the spirit of mutual respect and trust, which is an essential part of collaboration.



Two-Eyed Seeing was brought forward by Elder Alton Marshall of Eelwanan Mi'kmaq First Nation during the *Imaginative Health and Healing* Project. In his words:

"Two-Eyed Seeing is and has to be your Guiding Principle as to how you should live while you are here on this Earth. Our journey here is not meant for our perspective or our convenience to get us through. We all need each other. The lesson that we are trying to put forth for our young people is that it is going to be much more respectful if we can take the best of a human both the white man has thought forth and the earth our forefathers have left to us ... in so all our gifts as we have the world a better place and thus the opportunities for our children and youth will not be compromised by our reactions today."



Concepts + Terms

A shared understanding

Visual icons were paired with verbal explanations to help participants both beyond terms and language to find common ground and differences in key concepts about health and the environment. Below are a few examples:



This research was funded by a Canadian Institutes of Health Research - Institute of Aboriginal Peoples' Health (CIHR-IPAH) grant to Sana Kavanagh, Cheryl Bartlett, Nadine Lefort, Mardena Marshall, Alton Marshall, and Alton Marshall. The research was also supported by the Cape Breton University, Nova Scotia, and Mi'kmaq community members from Cape Breton Island, Nova Scotia, and Western scientists.

1

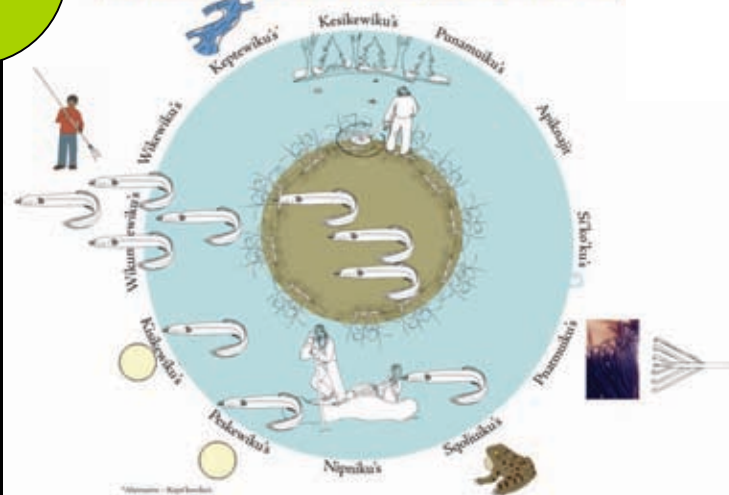


2



3

Mi'kmawe'k Tepknusetk



LESSONS LEARNED

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

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

view "SCIENCE"
inclusively

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

“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

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

I Got It From an Elder



Conversations
in Healing
Language

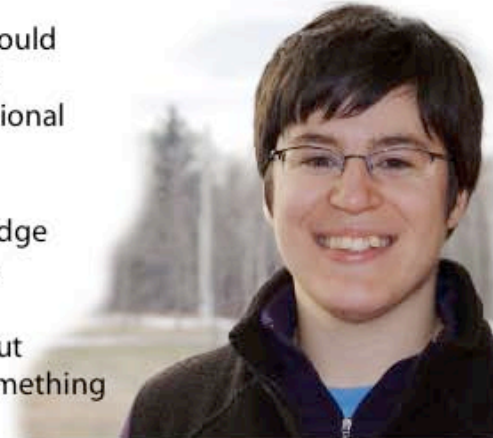
Iwama et al. 2007; Gaspereau Press Limited

Telvisi Sana

CONSENT FORM page 1/8:

**"Mi'kmaq traditional ecological knowledge of American eel:
qualitative research for integrative science education"**

Hi, my name is Sana Kavanagh.
I am from Westmount, Cape Breton. I would like to do research with Mi'kmaq Elders from Cape Breton about Mi'kmaq traditional ecological knowledge of American eel. The title of my project is "Mi'kmaq traditional ecological knowledge of American eel: qualitative research for integrative science education". Would you take a moment to learn about my project and decide if it would be something you would like to participate in?



My Roles:



CAPE BRETON UNIVERSITY

Research Assistant

I am a research assistant for the Integrative Science program at Cape Breton University. This program brings together Aboriginal and Western science knowledge. By doing this research, I will be fulfilling part of my job responsibilities.

Cheryl Bartlett, of the Integrative Science program, at Cape Breton University is a co-investigator in this project. She will be providing guidance in this research.



DALHOUSIE UNIVERSITY

Inspiring Minds

Graduate Student

I am a Masters of Environmental Studies student at Dalhousie University. By doing this research, I will be fulfilling part of the requirements to get a masters degree.

My academic supervisors will be providing guidance in this research. My supervisors are:

Fay Cohen
Patti Doyle-Bedwell

LESSONS LEARNED

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

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

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

view "SCIENCE"
inclusively

use **VISUALS**



Bringing Knowledges Together





Integrative Science

SCIENCE

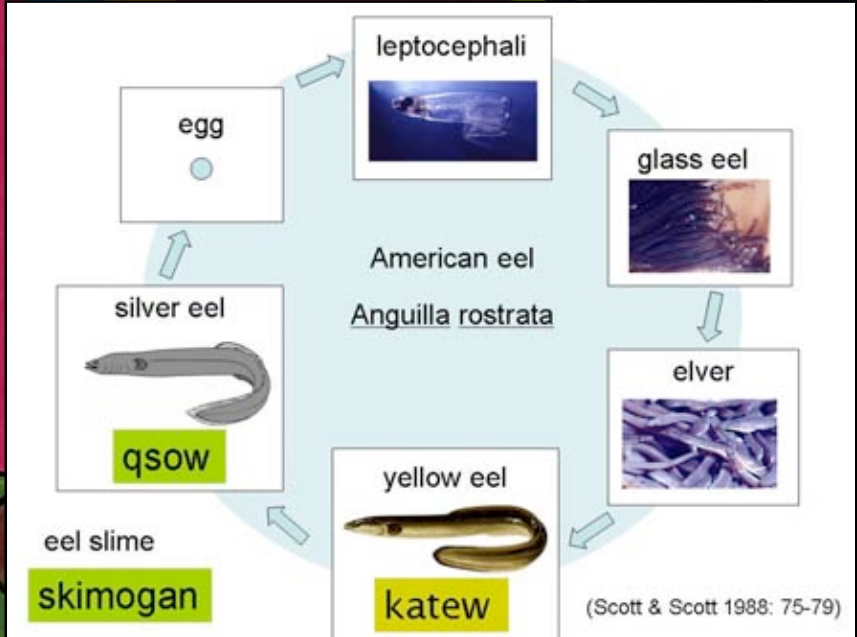
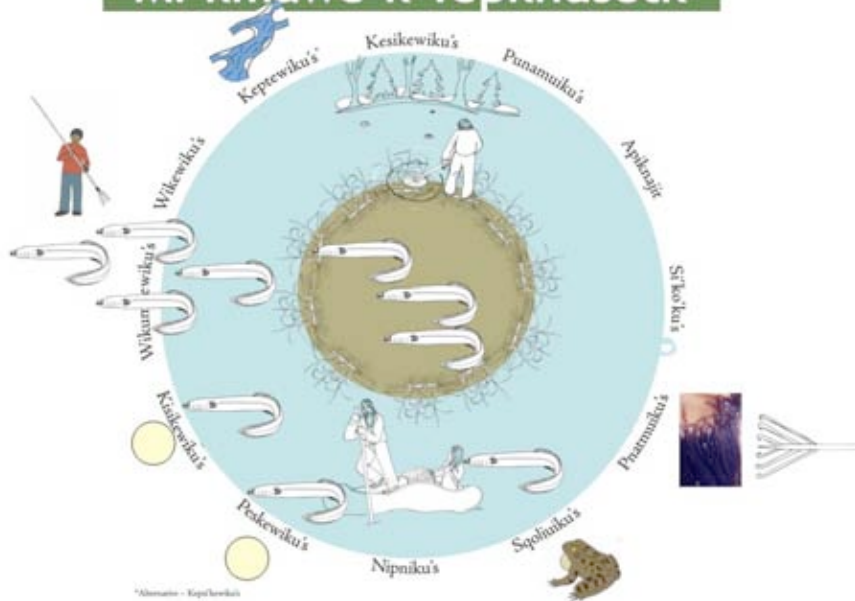
education, research, applications,
youth and community outreach

Indigenous

Western

“bringing our sciences together”

Mi'kmawé'k Tepknusetk



LESSONS LEARNED

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

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

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

WEAVE
back and forth between
our worldviews

weave via
BIG PICTURES

use **VISUALS**

view "SCIENCE"
inclusively





Two-Eyed Seeing

learning to see with the strengths of each & together

OUR WORLDS

#1

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



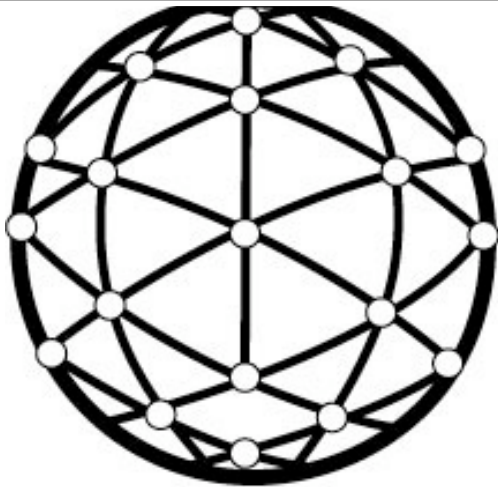
Two-Eyed Seeing

learning to see with the strengths of each & together

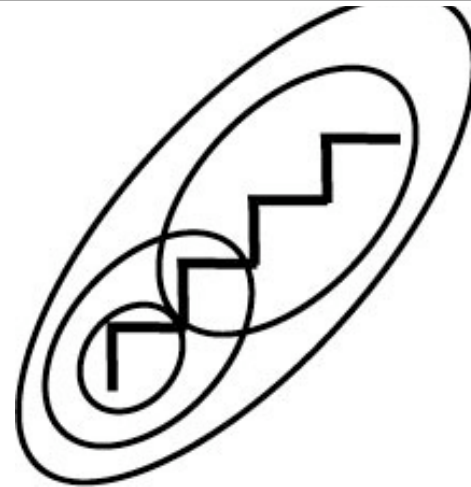
OUR WORLDS

#1

interconnective



parts & wholes





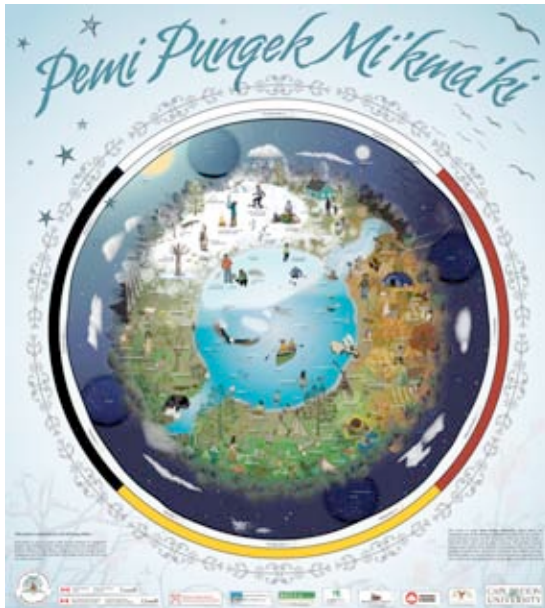
Two-Eyed Seeing

learning to see with the strengths of each & together

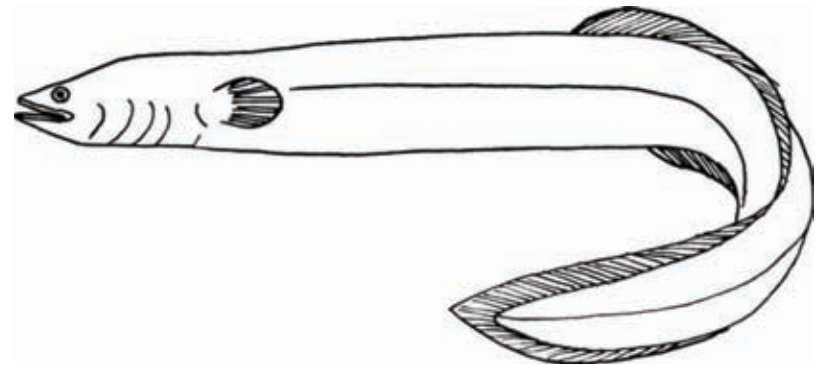
OUR WORLDS

#1

interconnective



parts & wholes





Two-Eyed Seeing

learning to see with the strengths of each & together

OUR KEY CONCEPTS and ACTIONS

#2

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



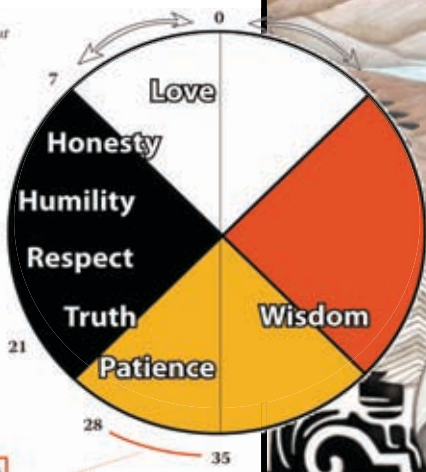
Two-Eyed Seeing

learning to see with the strengths of each & together

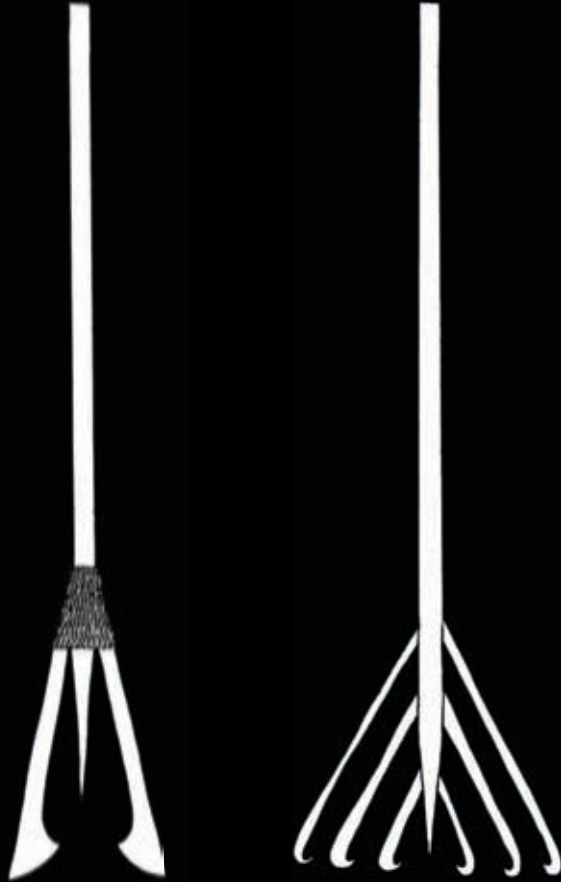
OUR KEY CONCEPTS and ACTIONS

#2

least
7
14
21
28
35



In using tools we must be very mindful of sustainability.



images: DFO, www.dfo-mpo.gc.ca





Two-Eyed Seeing

learning to see with the strengths of each & together

OUR LANGUAGES and METHODOLOGIES

#3

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

#3

OUR LANGUAGES and METHODOLOGIES

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
&
Instruments

rigour

UN-WEAVING

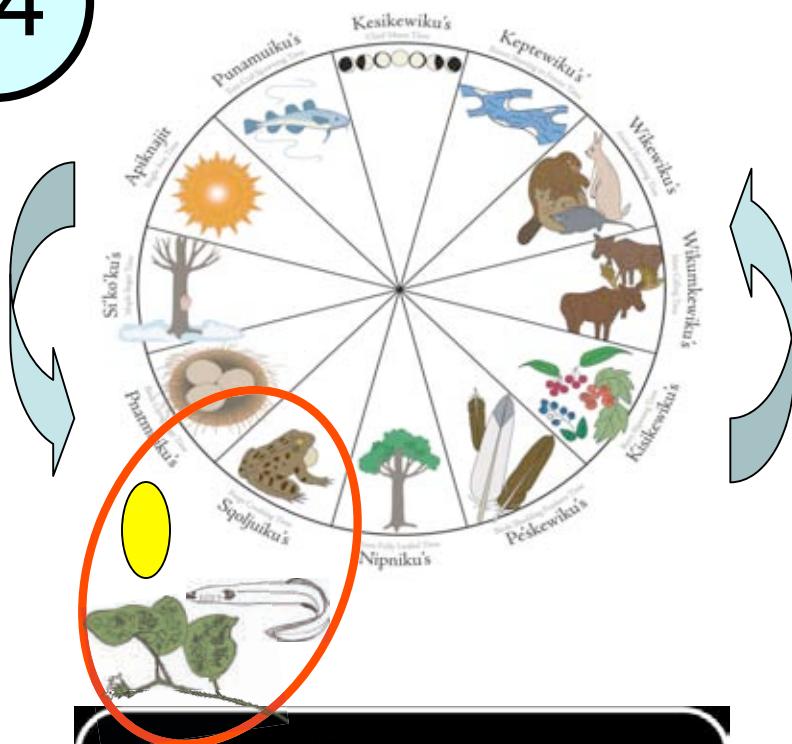


Two-Eyed Seeing

learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4



towards resonance
of understanding
within environment

| month | | | | |
|-------|--|--|--|--|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

towards construction
of understanding
of environment



Two-Eyed Seeing

learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4

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

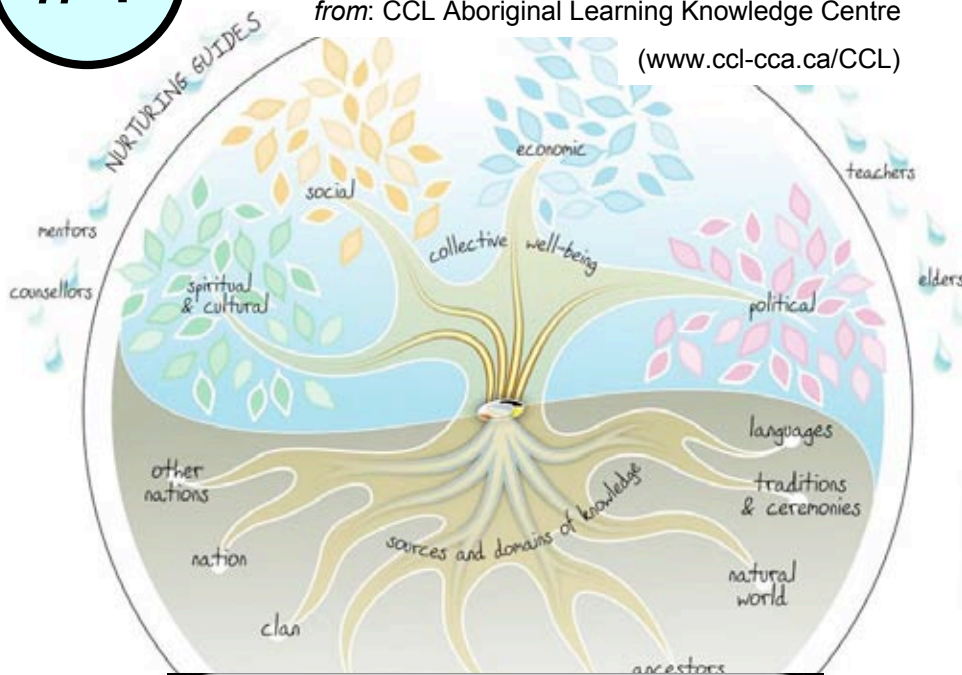
learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

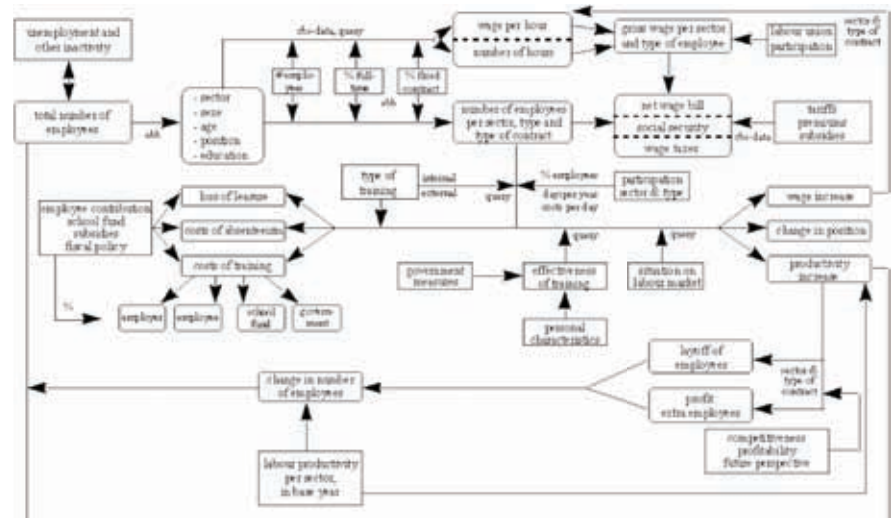
#4

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

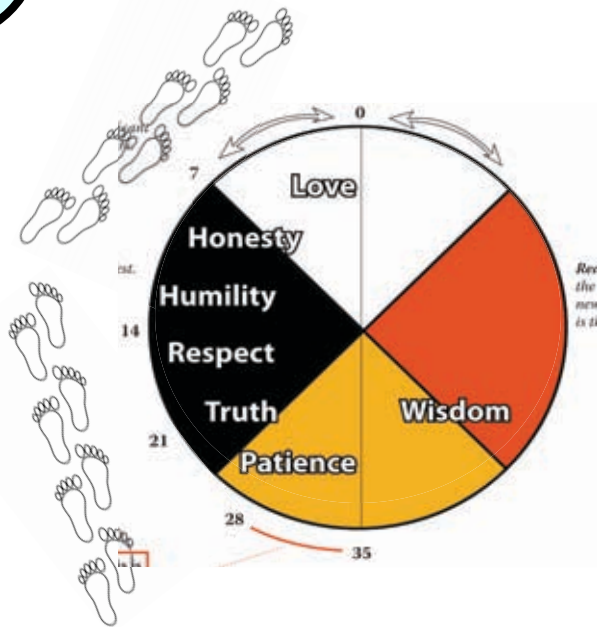


Two-Eyed Seeing

learning to see with the strengths of each & together

OUR OVERALL KNOWLEDGE OBJECTIVES

#4



towards resonance
of understanding
within environment

towards construction
of understanding
of environment





Bringing Knowledges Together





Two-Eyed Seeing





**Megwetch
Wela'liog
Merci
Thank you**