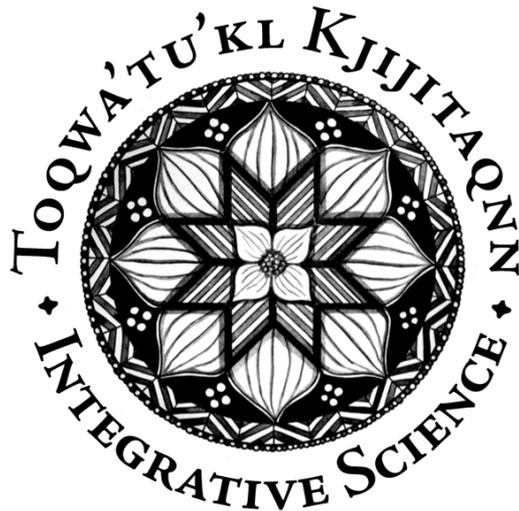


INTEGRATIVE SCIENCE at Cape Breton University ... academic program & supporting research



presentation by: **Cheryl Bartlett, PhD**, Canada Research Chair in Integrative Science



CAPE BRETON
UNIVERSITY

Aboriginal Studies
University of Toronto
science discussion committee
6 November 2007

Canada Research Chairs / Chaires de recherche du Canada / Canada

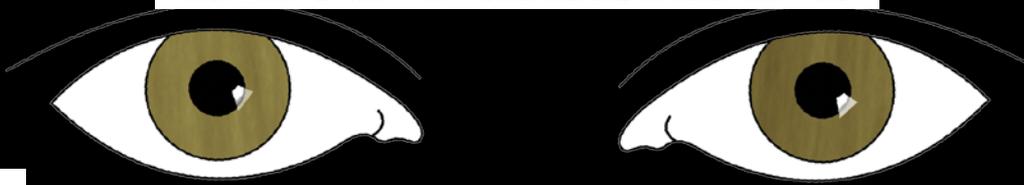
Social Sciences and Humanities Research Council of Canada / Conseil de recherches en sciences humaines du Canada

Canada Foundation for Innovation / Fondation canadienne pour l'innovation

CAPE BRETON UNIVERSITY



CIHR IRSC / Canadian Institutes of Health Research / Instituts de recherche en santé du Canada



IWK Health Centre Foundation

IAPH

ATLANTIC ABORIGINAL Health Research Program

Mi'kmaq Elders

NOVA SCOTIA Health Research FOUNDATION

SABLE OFFSHORE ENERGY INCORPORATED

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

KECCA Knowledge: Education and Cultural Consultant Associates

NSERC CRSNG

Mi'kmawey Debert

Royal Canadian Mounted Police / Gendarmerie royale du Canada

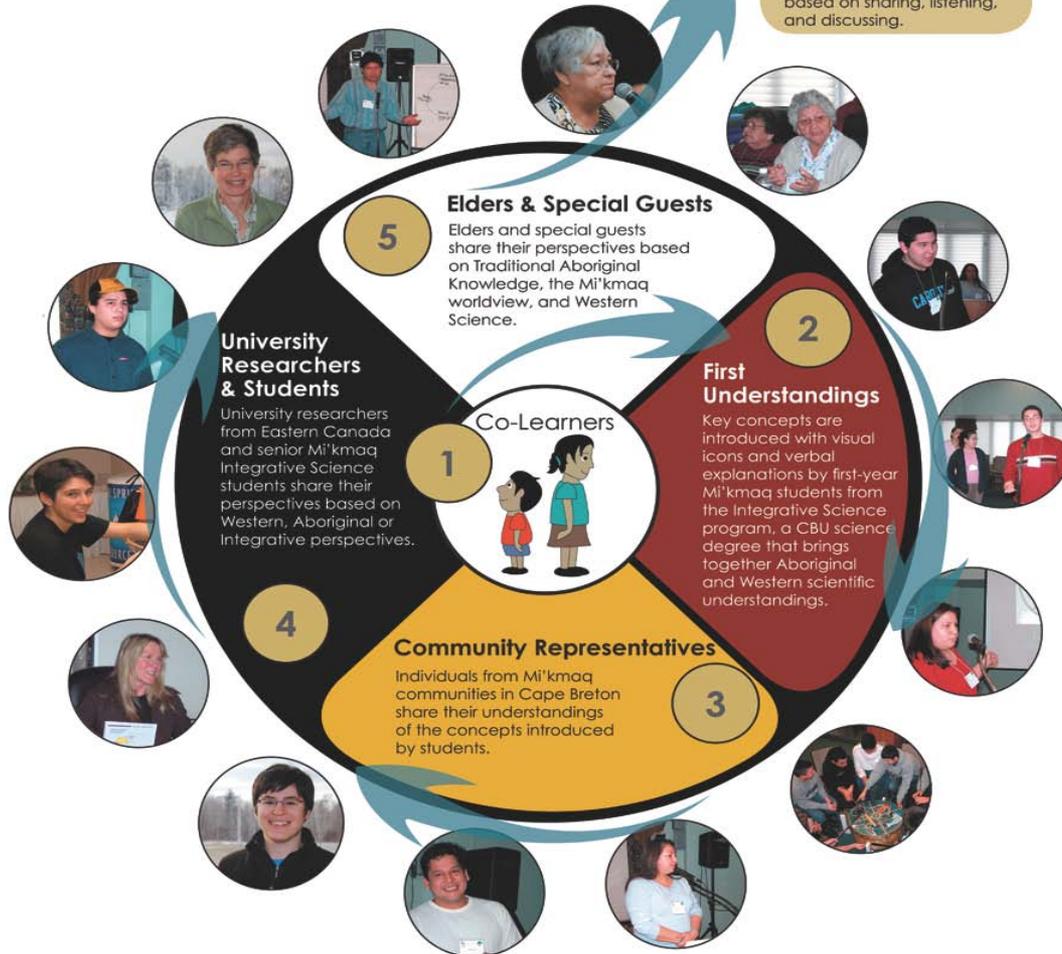
Co-Learning Journey

: 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 discussion, 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.



**10+ years: where our journey
has been and continues to be ...**

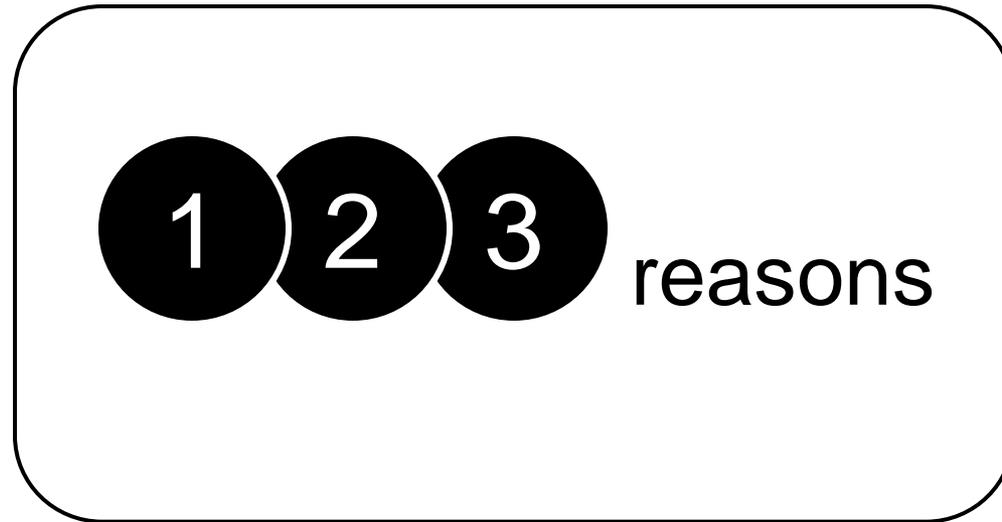
Integrative Science

**bringing together Indigenous and Western
scientific knowledges and ways of knowing**

Indigenous

Western

Why our journey started ...



Indigenous

Western

Why?

1



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

Why?

1

mid 1990's

CAPE BRETON UNIVERSITY

no Mi'kmaq students in science

MI'KMA'KI

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

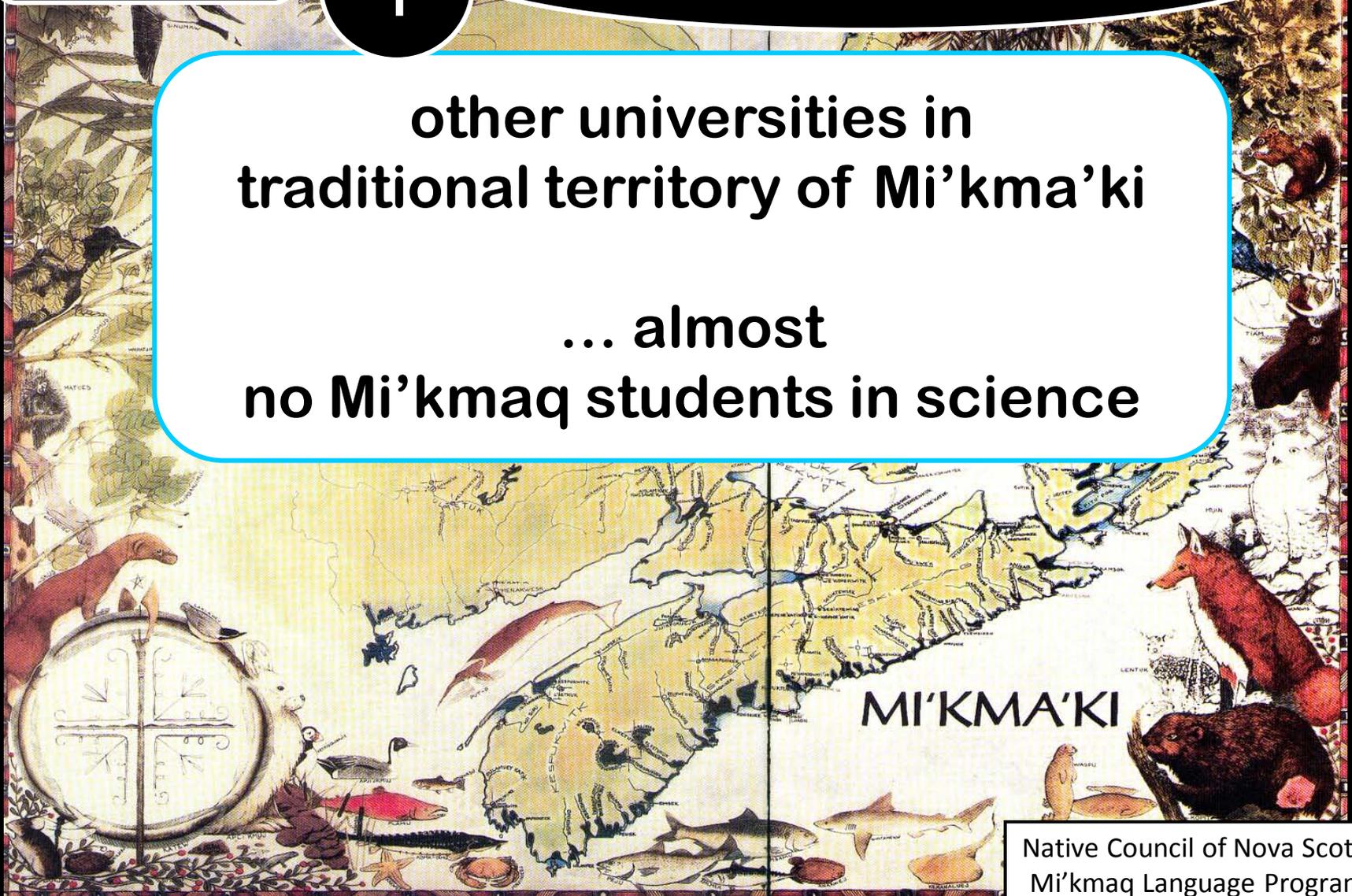
Why?

1

mid 1990's & now

**other universities in
traditional territory of Mi'kma'ki**

**... almost
no Mi'kmaq students in science**



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

Why?

1

mid 1990's & now

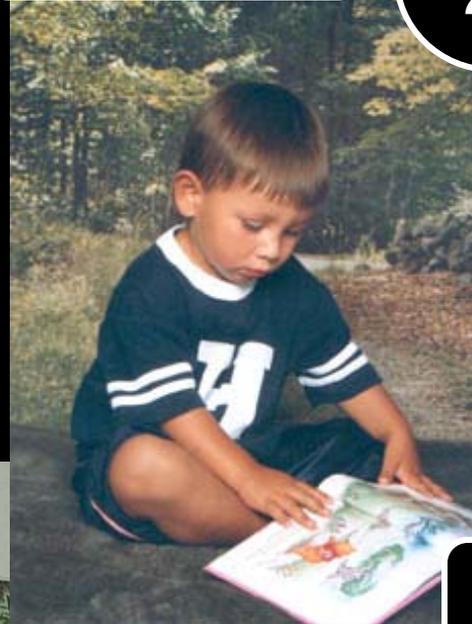


Mi'kma'ki

same picture, other Aboriginal students
... universities across Canada
and throughout North America

Why?

2



... and many, many youth



Why?

3

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

Integrative Science



Artist Basma Kavanagh

Integrative Science

SCIENCE

education, research, applications,
youth and community outreach

Indigenous

our sciences
our stories

Western

“bringing our knowledges together”

our worldviews



**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.**

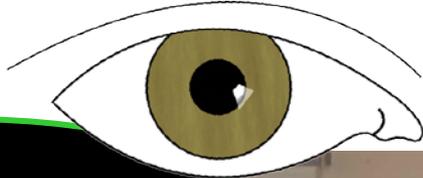
(late Mi'kmaq Chief, Spiritual Elder, and Healer Charlie Labrador)



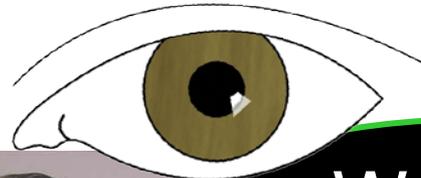
Indigenous

Western

“Two-Eyed Seeing”



Indigenous



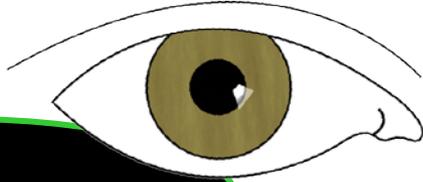
Western



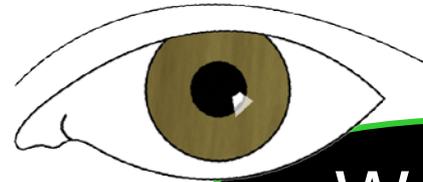
Mr. Albert Marshall, Mi'kmaq Elder
Eskasoni First Nation

stories of our interactions with and within nature

“Two-Eyed Seeing”



Indigenous



Western

Science

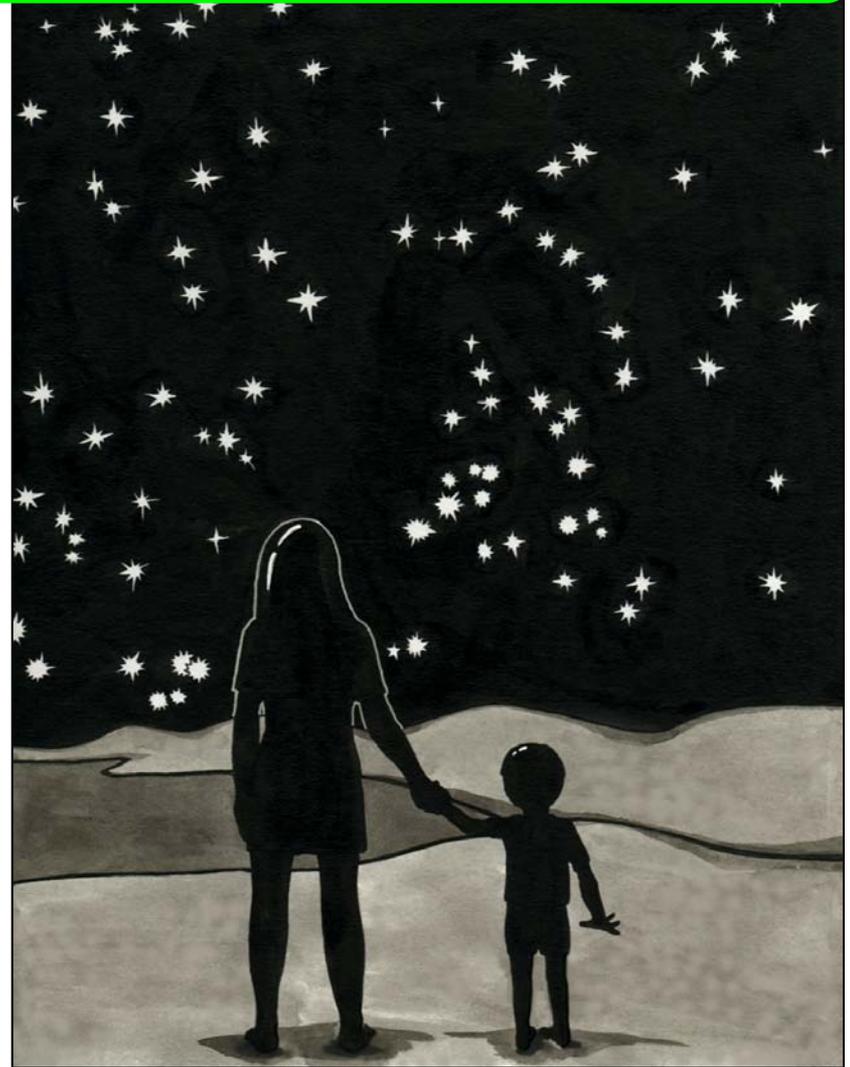
DYNAMIC, PATTERN-BASED KNOWLEDGE
PATTERN: recognition, transformation, expression

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”, i.e. pattern stories.

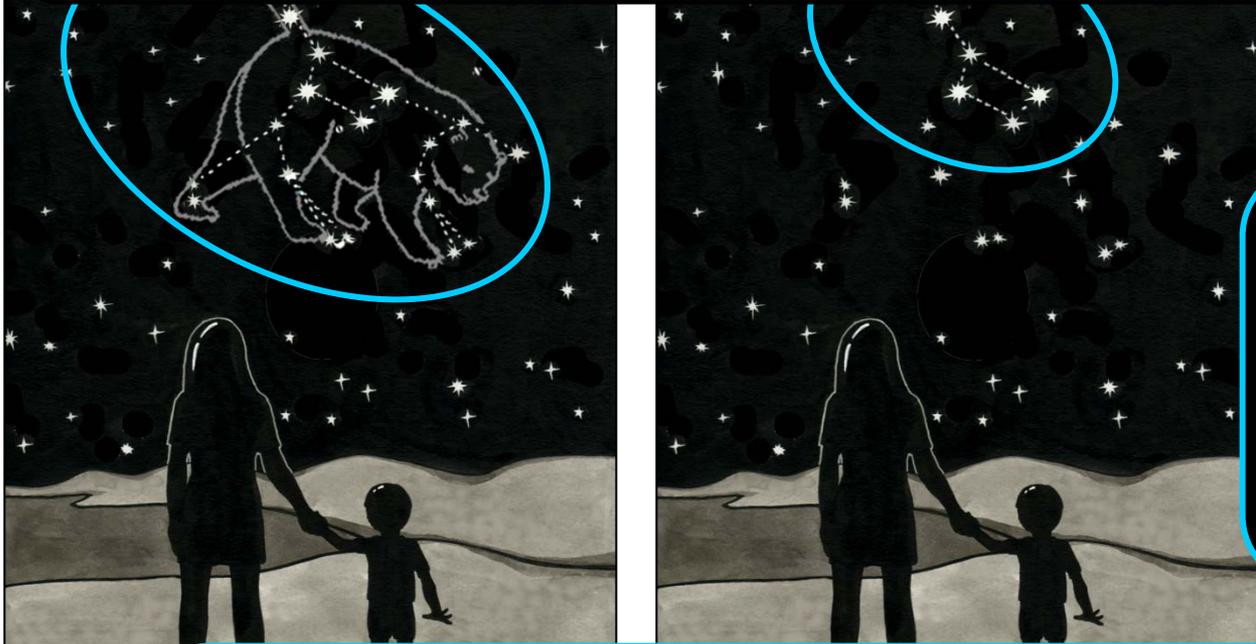


Artist Basma Kavanagh

Science is pattern-based knowledge.

stories of our interactions with and within nature

Science: dynamic, pattern-based knowledge

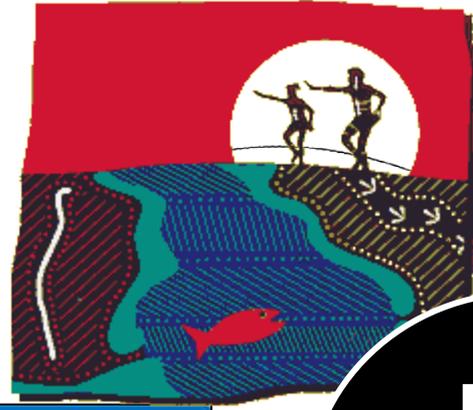
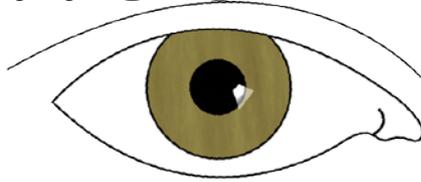


the patterns
that we see
within nature
reflect our ...

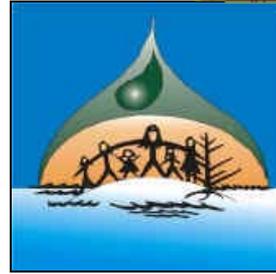
**SANCTIONED
PERSPECTIVES & INTELLIGENCES:**
who we are; where we are; where we were;
what we know, do and value

stories of our interactions with and within nature

Science



Life
Love
Land



Toqwa'tu'kl Kijitaqnn Integrative Science



What

Why

How

Who

PSE sciences with few Aboriginal students

Who?



CAPE BRETON
UNIVERSITY

1999-2007

> 100 Mi'kmaq
students have
experienced
1st year science



CAPE BRETON
UNIVERSITY

2005-2006:

Mi'kmaq
students

- 1st yr
- 2nd yr
- 3rd yr
- 4th yr

• grads: 7
(total)

CAPE BRETON
UNIVERSITY

2006-2007:

q Int Sci
(approx.)

- yr: 3
- yr: 4 ?
- yr: 3
- yr: 5

grads: 12*
(total)



Toqwa'tu'kl Kijitaqnn Integrative Science



What

Why

How

Who

science curricula lack Aboriginal perspectives

How?



PART 1) Innovative program structure

- degree profile
 - 40 courses (120 credits)
 - 2 work placements (non credit)
- conventional courses: 32 of 40
- innovative courses: 8 of 40

PART 2) Innovative courses (MSIT)

- integrative framework
- curricular components
- pattern recognition & transformation

4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kjjitaqnn /
Integrative Science**

Bringing Knowledges Together
... from Western scientific and Aboriginal world views



Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent
- 7) _____ business perspectives (3 credits): Buss 111, Buss 231, or equivalent
- 8) _____ public communication (3 credits): Comm 103, Comm 105, or equivalent
- 9) _____ effective writing (6 credits): Engl 100, Engl 205 + Engl 207, or equivalent
- 10) _____ computer literacy (3 credits): Phil 115, Comp 102 or 111, Buss 181, or equivalent
- 11) _____ statistics (3 credits): Math 135, Math 335, Buss 182, Psych 201, or equivalent

Science Area of Concentration (42 credits)

a) University (8 courses)

- 1) 3 credits: MSIT 101
- 2) 3 credits: MSIT 103
- 3) 3 credits: MSIT 201
- 4) 3 credits: MSIT 203
- 5) 3 credits: MSIT 301
- 6) 3 credits: MSIT 303
- 7) 3 credits: MSIT 401
- 8) 3 credits: MSIT 401

b) Technology (6 courses)

- 1 + 2) 6 credits: Chem 121 + 122
- 3 + 4) 6 credits: Math 131 + 132, or
Phys 100, or Phys 111 + 112
- 5 + 6) 6 credits (at least 3 credits must be at 300 level):
- Geol 111
- any PubH at 200 level or higher
- any Envi at 200 level or higher

Student's Electives (30 credits)

- | | |
|---------------------|----------------------|
| 1) 3 credits: _____ | 6) 3 credits: _____ |
| 2) 3 credits: _____ | 7) 3 credits: _____ |
| 3) 3 credits: _____ | 8) 3 credits: _____ |
| 4) 3 credits: _____ | 9) 3 credits: _____ |
| 5) 3 credits: _____ | 10) 3 credits: _____ |

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

**An overall average of 60% (in courses
over your four years) is required for
graduation.**



4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kijjitaqnn /
Inteagrative Science**



1) core

Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent
- 7) _____ business perspectives (3 credits): Buss 111, Buss 231, or equivalent
- 8) _____ public communication (3 credits): Comm 103, Comm 105, or equivalent
- 9) _____ effective writing (6 credits): Engl 100, Engl 205 + Engl 207, or equivalent
- 10) _____ computer literacy (3 credits): Phil 115, Comp 102 or 111, Buss 181, or equivalent
- 11) _____ statistics (3 credits): Math 135, Math 335, Buss 182, Psych 201, or equivalent

Science Area of Concentration (42 credits)

- | | |
|---------------------------|---|
| a) University (8 courses) | b) Technology (6 courses) |
| 1) 3 credits: MSIT 101 | 1 + 2) 6 credits: Chem 121 + 122 |
| 2) 3 credits: MSIT 103 | |
| 3) 3 credits: MSIT 201 | 3 + 4) 6 credits: Math 131 + 132, or |
| 4) 3 credits: MSIT 203 | Phys 100, or Phys 111 + 112 |
| 5) 3 credits: MSIT 301 | 5 + 6) 6 credits (at least 3 credits must be at 300 level): |
| 6) 3 credits: MSIT 303 | - Geol 111 |
| 7) 3 credits: MSIT 401 | - any PubH at 200 level or higher |
| 8) 3 credits: MSIT 401 | - any Envi at 200 level or higher |

Student's Electives (30 credits)

- | | |
|---------------------|----------------------|
| 1) 3 credits: _____ | 6) 3 credits: _____ |
| 2) 3 credits: _____ | 7) 3 credits: _____ |
| 3) 3 credits: _____ | 8) 3 credits: _____ |
| 4) 3 credits: _____ | 9) 3 credits: _____ |
| 5) 3 credits: _____ | 10) 3 credits: _____ |

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

An overall average of 60% (in courses over your four years) is required for graduation.



CREDITS: 48
Science: PCS (3 full courses)
Topics: perspectives* & skills*

4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kjjitaqnn /
Integrative Science**

Bringing Knowledges Together
... from Western scientific and Aboriginal world views



Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent

2) concentration

Science Area of Concentration (42 credits)

- | | |
|----------------------------------|---|
| a) <u>University</u> (8 courses) | b) <u>Technology</u> (6 courses) |
| 1) 3 credits: MSIT 101 | 1 + 2) 6 credits: Chem 121 + 122 |
| 2) 3 credits: MSIT 103 | |
| 3) 3 credits: MSIT 201 | 3 + 4) 6 credits: Math 131 + 132, or |
| 4) 3 credits: MSIT 203 | Phys 100, or Phys 111 + 112 |
| 5) 3 credits: MSIT 301 | 5 + 6) 6 credits (at least 3 credits must be at 300 level): |
| 6) 3 credits: MSIT 303 | - Geol 111 |
| 7) 3 credits: MSIT 401 | - any PubH at 200 level or higher |
| 8) 3 credits: MSIT 401 | - any Envi at 200 level or higher |

Student's Electives (10 credits)

- | | |
|---------------------|----------------------|
| 1) 3 credits: _____ | 6) 3 credits: _____ |
| 2) 3 credits: _____ | 7) 3 credits: _____ |
| 3) 3 credits: _____ | 8) 3 credits: _____ |
| 4) 3 credits: _____ | 9) 3 credits: _____ |
| 5) 3 credits: _____ | 10) 3 credits: _____ |

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

An overall average of 60% (in courses over your four years) is required for graduation.



CREDITS: 42

Science: university & applied (tech)

**MSIT
courses
(core)
24 credits**

4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kjjitaqnn /
Integrative Science**

Bringing Knowledges Together
... from Western scientific and Aboriginal world views



Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent
- 7) _____ business perspectives (3 credits): Buss 111, Buss 231, or equivalent
- 8) _____ public communication (3 credits): Comm 103, Comm 105, or equivalent
- 9) _____ effective writing (6 credits): Engl 100, Engl 205 + Engl 207, or equivalent
- 10) _____ computer literacy (3 credits): Phil 115, Comp 102 or 111, Buss 181, or equivalent
- 11) _____ statistics (3 credits): Math 135, Math 335, Buss 182, Psych 201, or equivalent

Science Area of Concentration (42 credits)

- | | |
|----------------------------------|---|
| a) <u>University</u> (8 courses) | b) <u>Technology</u> (6 courses) |
| 1) 3 credits: MSIT 101 | 1 + 2) 6 credits: Chem 121 + 122 |
| 2) 3 credits: MSIT 103 | |
| 3) 3 credits: MSIT 201 | 3 + 4) 6 credits: Math 131 + 132, or |
| 4) 3 credits: MSIT 203 | Phys 100, or Phys 111 + 112 |
| | 5) 6 credits (at least 3 credits must be at 300 level): |
| | - Geol 111 |
| | - any PubH at 200 level or higher |

3) electives

Student's Electives (30 credits)

- | | |
|---------------------|----------------------|
| 1) 3 credits: _____ | 6) 3 credits: _____ |
| 2) 3 credits: _____ | 7) 3 credits: _____ |
| 3) 3 credits: _____ | 8) 3 credits: _____ |
| 4) 3 credits: _____ | 9) 3 credits: _____ |
| 5) 3 credits: _____ | 10) 3 credits: _____ |

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

**An overall average of 60% (in courses
over your four years) is required for
graduation.**



CREDITS: 30

Science: all, some, none

4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kjjitaqnn /
Integrative Science**

Bringing Knowledges Together
... from Western scientific and Aboriginal world views



Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent
- 7) _____ business perspectives (3 credits): Buss 111, Buss 231, or equivalent
- 8) _____ public communication (3 credits): Comm 103, Comm 105, or equivalent
- 9) _____ effective writing (6 credits): Engl 100, Engl 205 + Engl 207, or equivalent
- 10) _____ computer literacy (3 credits): Phil 115, Comp 102 or 111, Buss 181, or equivalent
- 11) _____ statistics (3 credits): Math 135, Math 335, Buss 182, Psych 201, or equivalent

Science Area of Concentration (42 credits)

- | | |
|---|---|
| <p>a) <u>University</u> (8 courses)</p> <ol style="list-style-type: none">1) 3 credits: MSIT 1012) 3 credits: MSIT 1033) 3 credits: MSIT 2014) 3 credits: MSIT 2035) 3 credits: MSIT 3016) 3 credits: MSIT 3037) 3 credits: MSIT 4018) 3 credits: MSIT 401 | <p>b) <u>Technology</u> (6 courses)</p> <p>1 + 2) 6 credits: Chem 121 + 122</p> <p>3 + 4) 6 credits: Math 131 + 132, or
Phys 100, or Phys 111 + 112</p> <p>5 + 6) 6 credits (at least 3 credits must be at 300 level):
- Geol 111
- any PubH at 200 level or higher
- any Envi at 200 level or higher</p> |
|---|---|

Student's Electives (30 credits)

- 1) 3 credits: _____
- 6) 3 credits: _____

4) work placements

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

**An overall average of 60% (in courses
over your four years) is required for
graduation.**

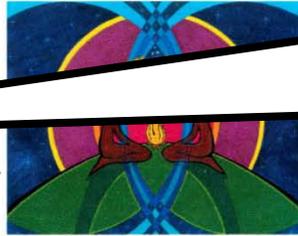
CREDITS: 0

Science: experience

4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kijjitaqnn /
Integrative Science**



1) core

Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent

CREDITS: 48

Science: PCS (3 core)

Topics: perspectives*
& skills*

2) concentration

Science Area of Concentration (42 credits)

- | | |
|----------------------------------|---|
| a) <u>University</u> (8 courses) | b) <u>Technology</u> (6 courses) |
| 1) 3 credits: MSIT 101 | 1 + 2) 6 credits: Chem 121 + 122 |
| 2) 3 credits: MSIT 103 | |
| 3) 3 credits: MSIT 201 | 3 + 4) 6 credits: Math 131 + 132, or
Phys 100, or Phys 111 + 112 |
| 4) 3 credits: MSIT 203 | 5) 6 credits (at least 3 credits must be at 300 level):
- Geol 111
- any PubH at 200 level or higher
- any other |

CREDITS: 42

Science: university &
applied (tech)

3) electives

Student's Electives (30 credits)

- 1) 3 credits: _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____
- 6) 3 credits: _____

CREDITS: 30

Science: all, some, none

4) work placements

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

An overall average of 60% (in courses
over your four years) is required for
graduation.

CREDITS: 0

Science: experience



4 yr Science Degree Program

Bachelor of Science Community Studies

Degree Profile for:
**Toqwa'tu'kl Kijjitaqnn /
Inteargative Science**



1) core

18

CREDITS: 48
Science: PCS (3 core)
**Topics: perspectives*
& skills***

2) concentration

42

CREDITS: 42
**Science: university &
applied (tech)**

3) electives

30

CREDITS: 30
Science: all, some, none

4) work placements

max. 105

**min. 60
(18+42)**

CREDITS: 0
Science: experience

Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent

Science Area of Concentration (42 credits)

- a) **University** (8 courses)
- 1) 3 credits: MSIT 101
 - 2) 3 credits: MSIT 103
 - 3) 3 credits: MSIT 201
 - 4) 3 credits: MSIT 203
- b) **Technology** (6 courses)
- 1 + 2) 6 credits: Chem 121 + 122
 - 3 + 4) 6 credits: Math 131 + 132, or Phys 100, or Phys 111 + 112
 - 5) 6 credits (at least 3 credits must be at 300 level):
- Geol 111
- any PubH at 200 level or higher
- any other science course at 200 level or higher

Student's Electives (30 credits)

- 1) 3 credits: _____
- 2) 3 credits: _____
- 3) 3 credits: _____
- 4) 3 credits: _____
- 5) 3 credits: _____
- 6) 3 credits: _____

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

An overall average of 60% (in courses over your four years) is required for graduation.



Bachelor of Science Community Studies

Degree Profile for: Toqwa'tu'kl Kjjitaqnn / Integrative Science

Bringing Knowledges Together
... from Western scientific and Aboriginal world views



Degree Core (48 credits)

- 1) _____ PCS 100: Analysis and Decision Making (6 credits)
- 2) _____ PCS 200: Applied Research (6 credits)
- 3) _____ PCS 300: Community Intervention (6 credits)
- 4) _____ science and technology perspectives (6 credits): Phil 222, or equivalent
- 5) _____ world views and values (3 credits): Phil 251, Phil 253, or equivalent
- 6) _____ Aboriginal perspectives (3 credits): Mikm at 100 or 200 level, or 361, or equivalent
- 7) _____ business perspectives (3 credits): Buss 111, Buss 231, or equivalent
- 8) _____ public communication (3 credits): Comm 103, Comm 105, or equivalent
- 9) _____ effective writing (6 credits): Engl 100, Engl 205 + Engl 207, or equivalent
- 10) _____ computer literacy (3 credits): Phil 115, Comp 102 or 111, Buss 181, or equivalent
- 11) _____ statistics (3 credits): Math 135, Math 335, Buss 182, Psych 201, or equivalent

Science Area of Concentration (42 credits)

- | | |
|--|--|
| <p>a) <u>University</u> (8 courses)</p> <ol style="list-style-type: none"> 1) 3 credits: MSIT 101 2) 3 credits: MSIT 103 3) 3 credits: MSIT 201 4) 3 credits: MSIT 203 5) 3 credits: MSIT 301 6) 3 credits: MSIT 303 7) 3 credits: MSIT 401 8) 3 credits: MSIT 401 | <p>b) <u>Technology</u> (6 courses)</p> <ol style="list-style-type: none"> 1 + 2) 6 credits: Chem 121 + 122 3 + 4) 6 credits: Math 131 + 132, or
Phys 100, or Phys 111 + 112 5 + 6) 6 credits (at least 3 credits must be at 300 level):
- Geol 111
- any PubH at 200 level or higher
- any Envi at 200 level or higher |
|--|--|

Student's Electives (30 credits)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1) 3 credits: _____ 2) 3 credits: _____ 3) 3 credits: _____ 4) 3 credits: _____ 5) 3 credits: _____ | <ol style="list-style-type: none"> 6) 3 credits: _____ 7) 3 credits: _____ 8) 3 credits: _____ 9) 3 credits: _____ 10) 3 credits: _____ |
|---|--|

Work Placements (paid or voluntary, each at least 120 hours)

- 1) _____
- 2) _____

An overall average of 60% (in courses over your four years) is required for graduation.



Science

PATTERN

**conceptual
space
shifting**

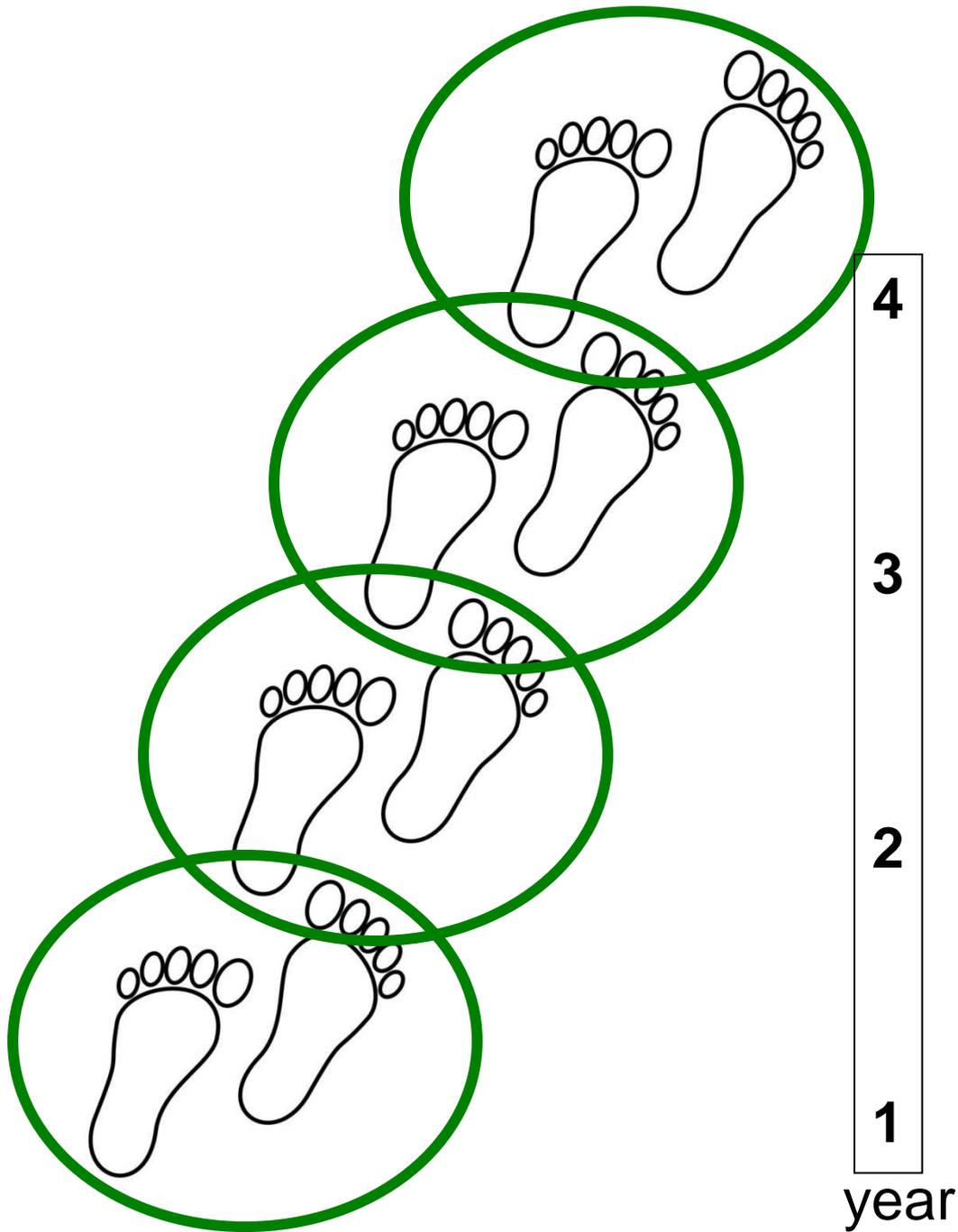
Science

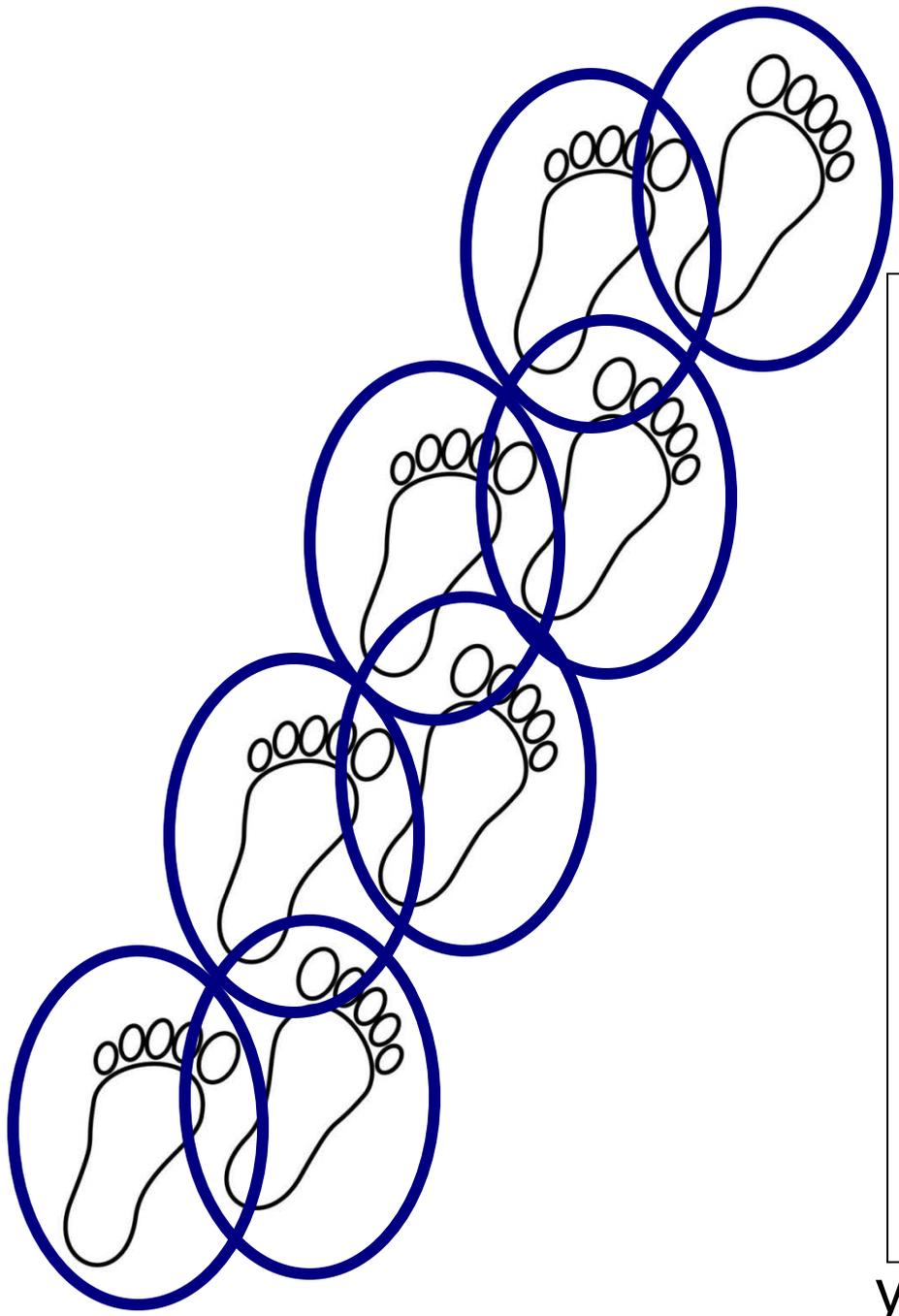
PATTERN

**conceptual
space
shifting**



4 Years



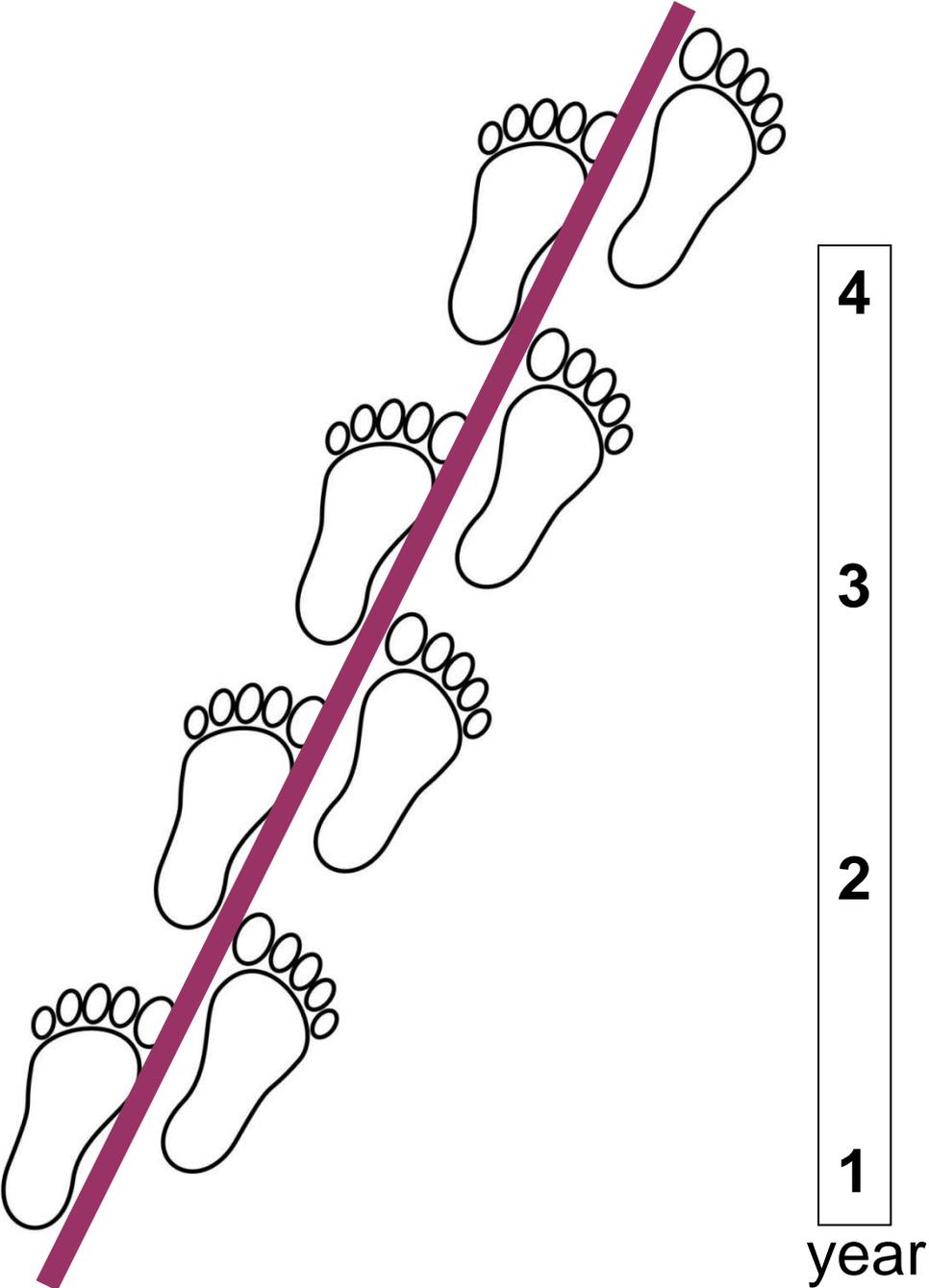


4
3
2
1

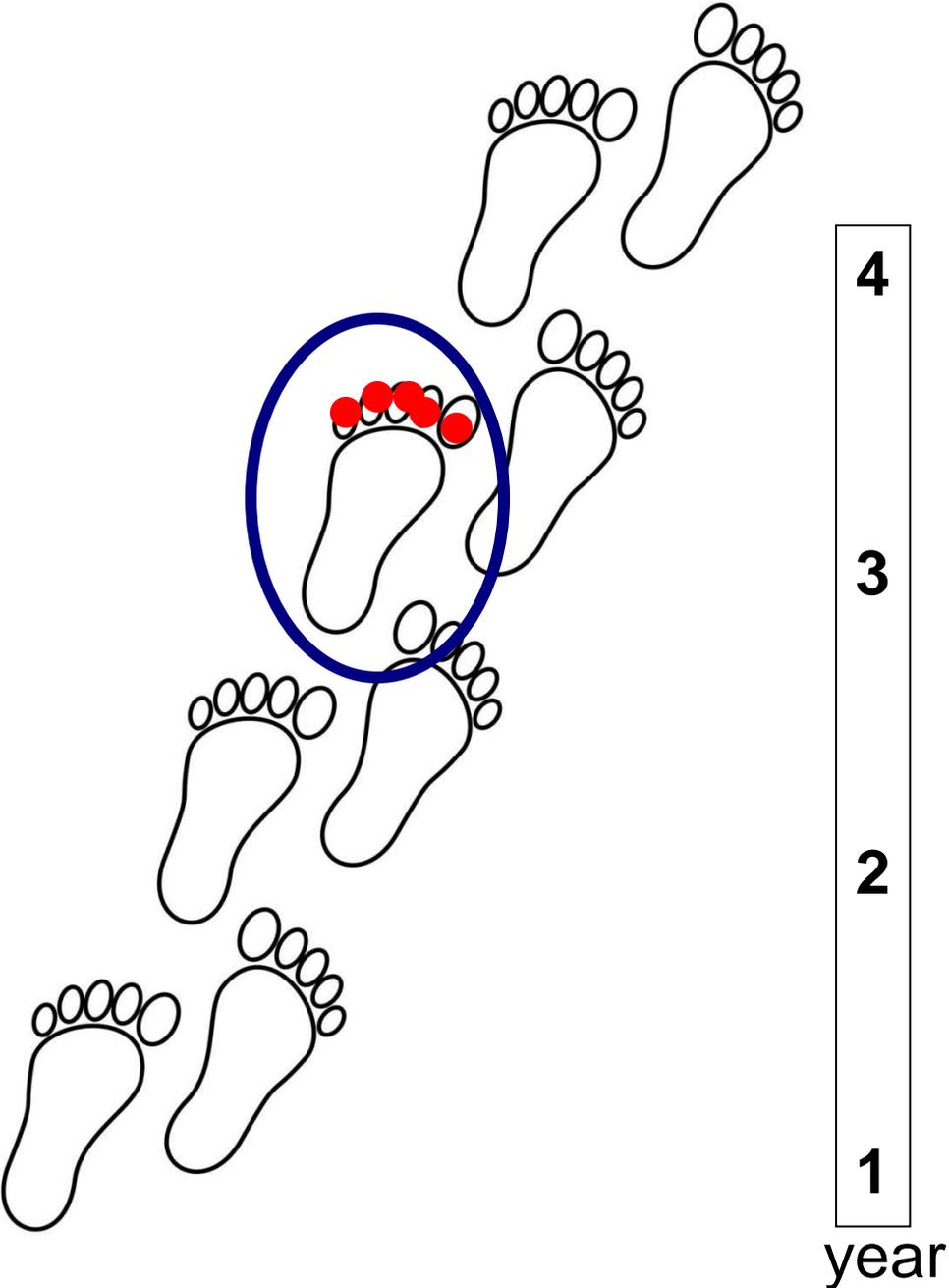
year

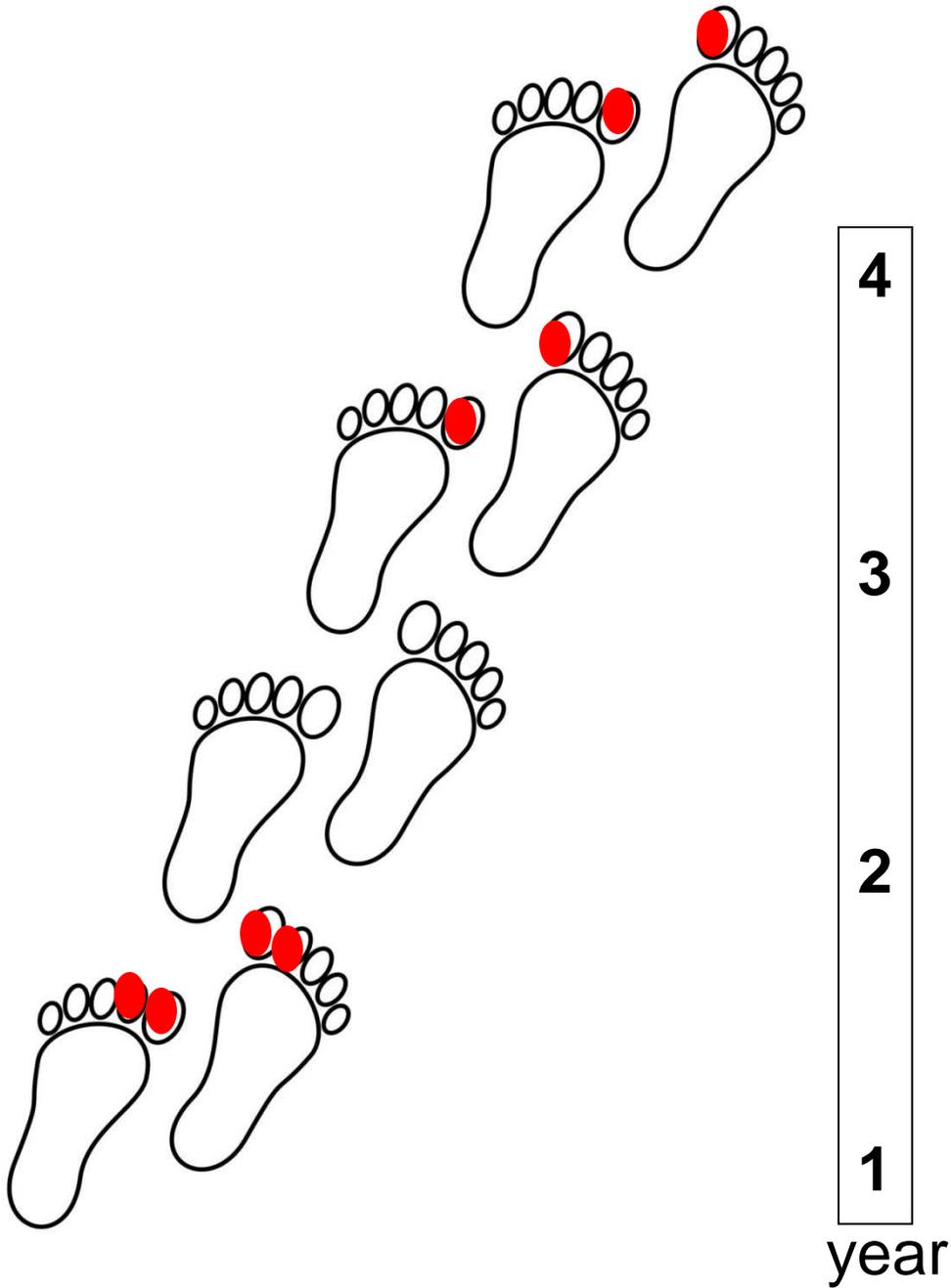
Fall terms
Winter terms

Christmas break

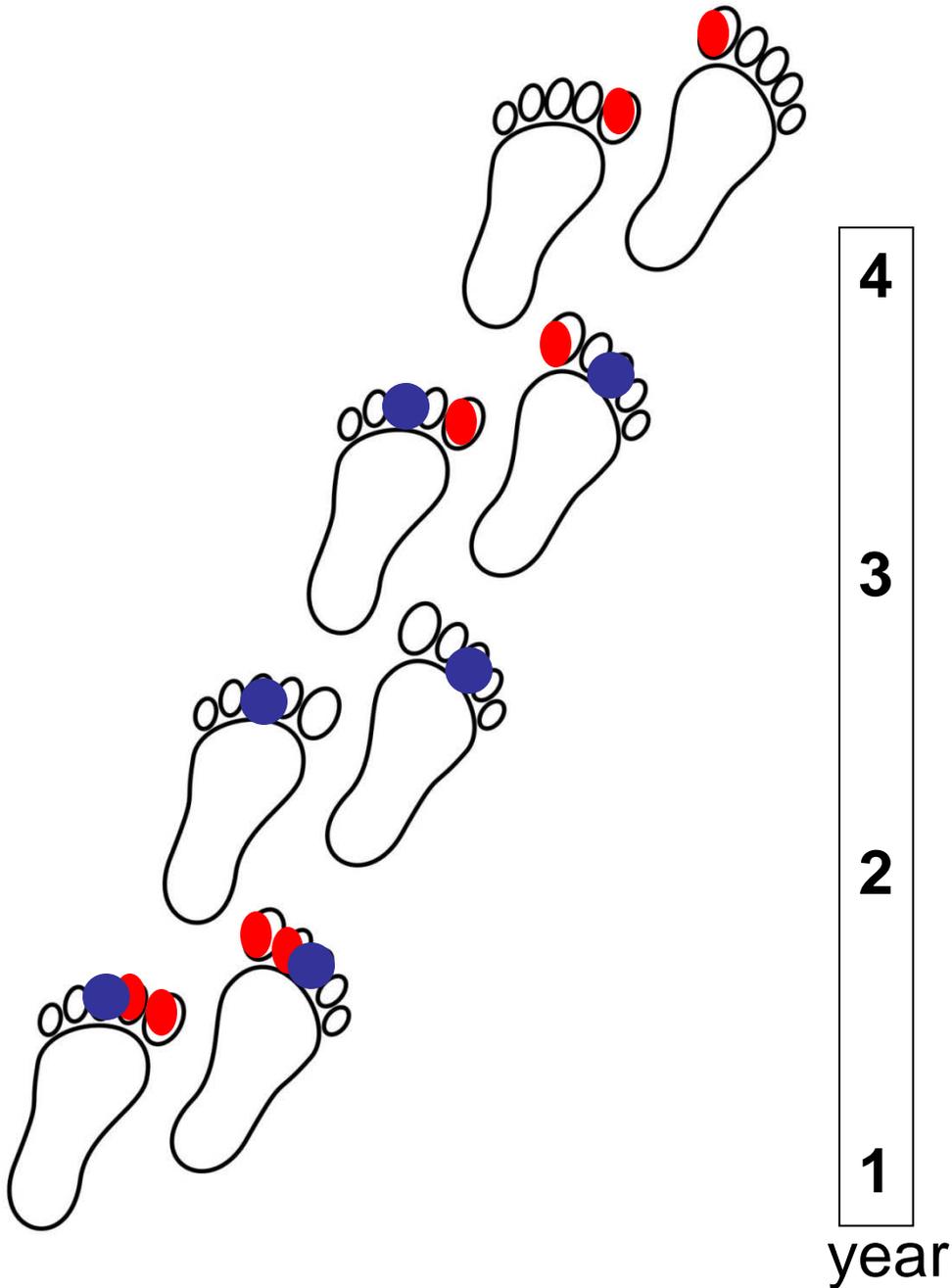


**Each term
= 5 courses**





MST
science
courses



**MSTT
science
courses**

**PCS
courses**

**MSTT
science
courses**

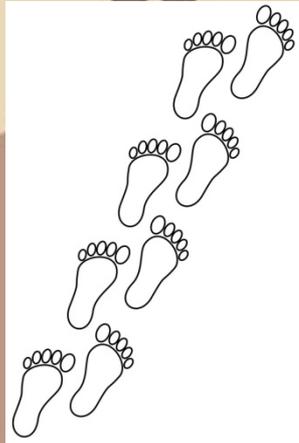
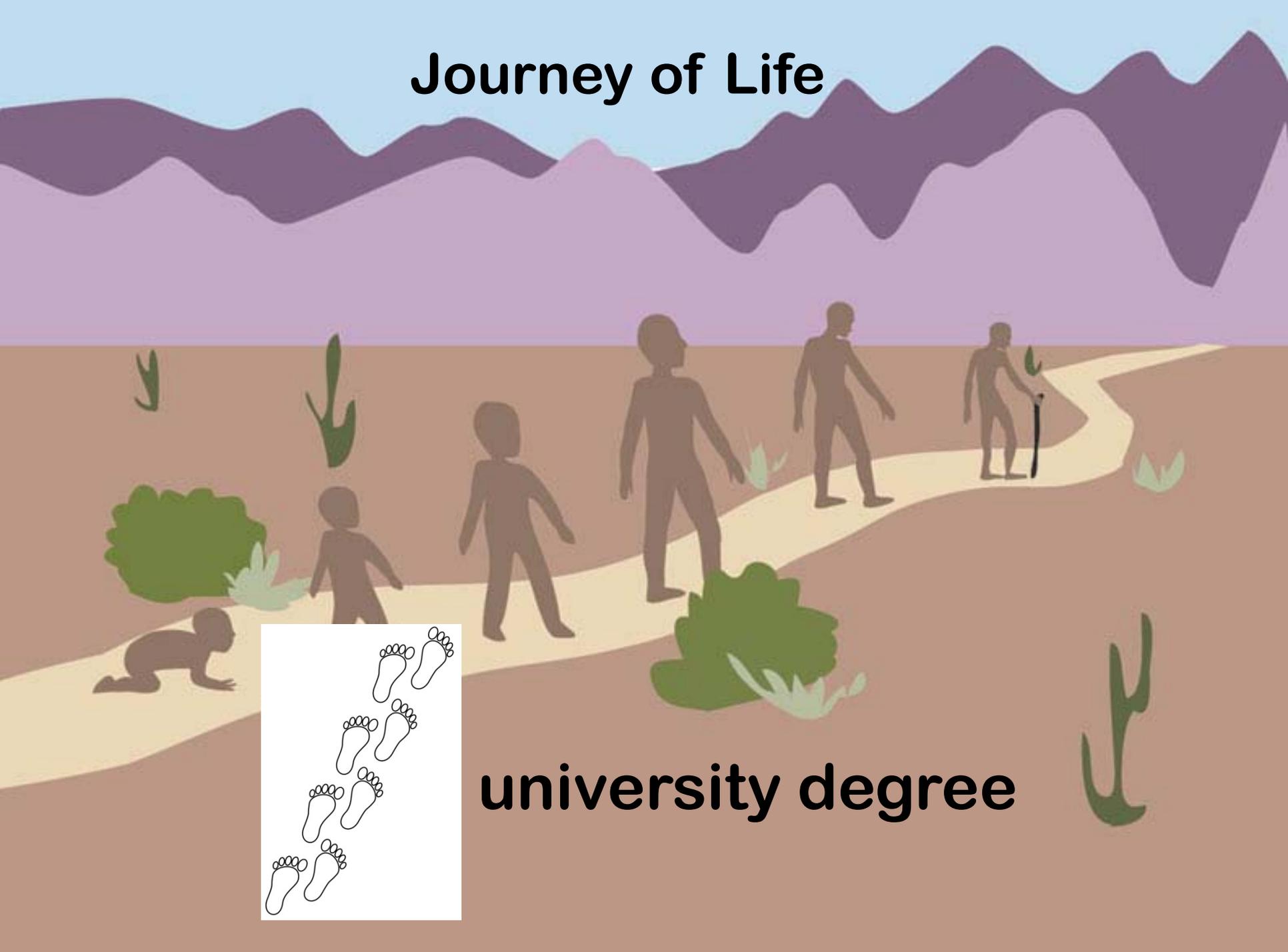
MSAP

**Mi'kmaq
Science
Advantage
Program**



1
year

Journey of Life



university degree

Toqwa'tu'kl Kijitaqnn Integrative Science



What

Why

How

Who

Where

PART 2
MSIT approach
& contents

How?

1



Mi'kmaq community Elders, resource people & organizations, TK events in community

2



TK literature

3



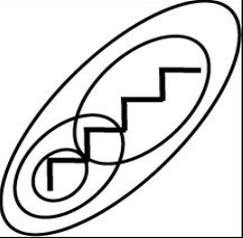
students out-of-doors

4

Aboriginal concepts & pedagogy

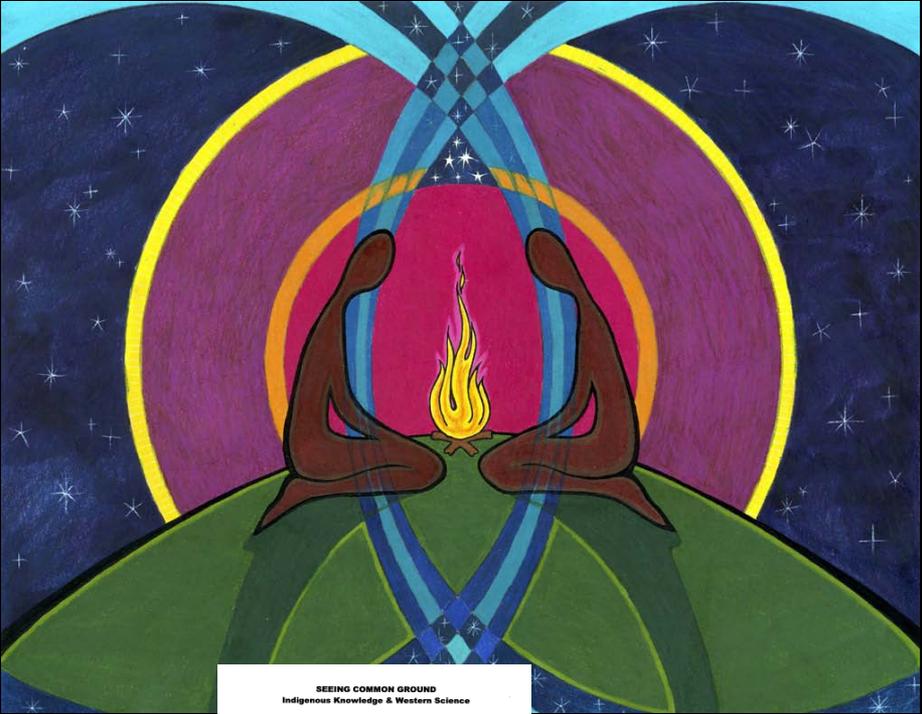
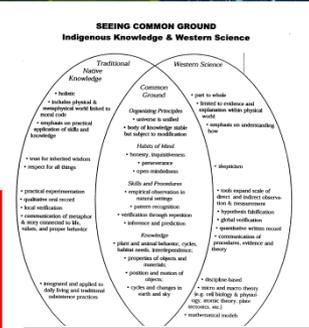


5



Western science: cosmology-physics-chemistry-geology-biology-consciousness

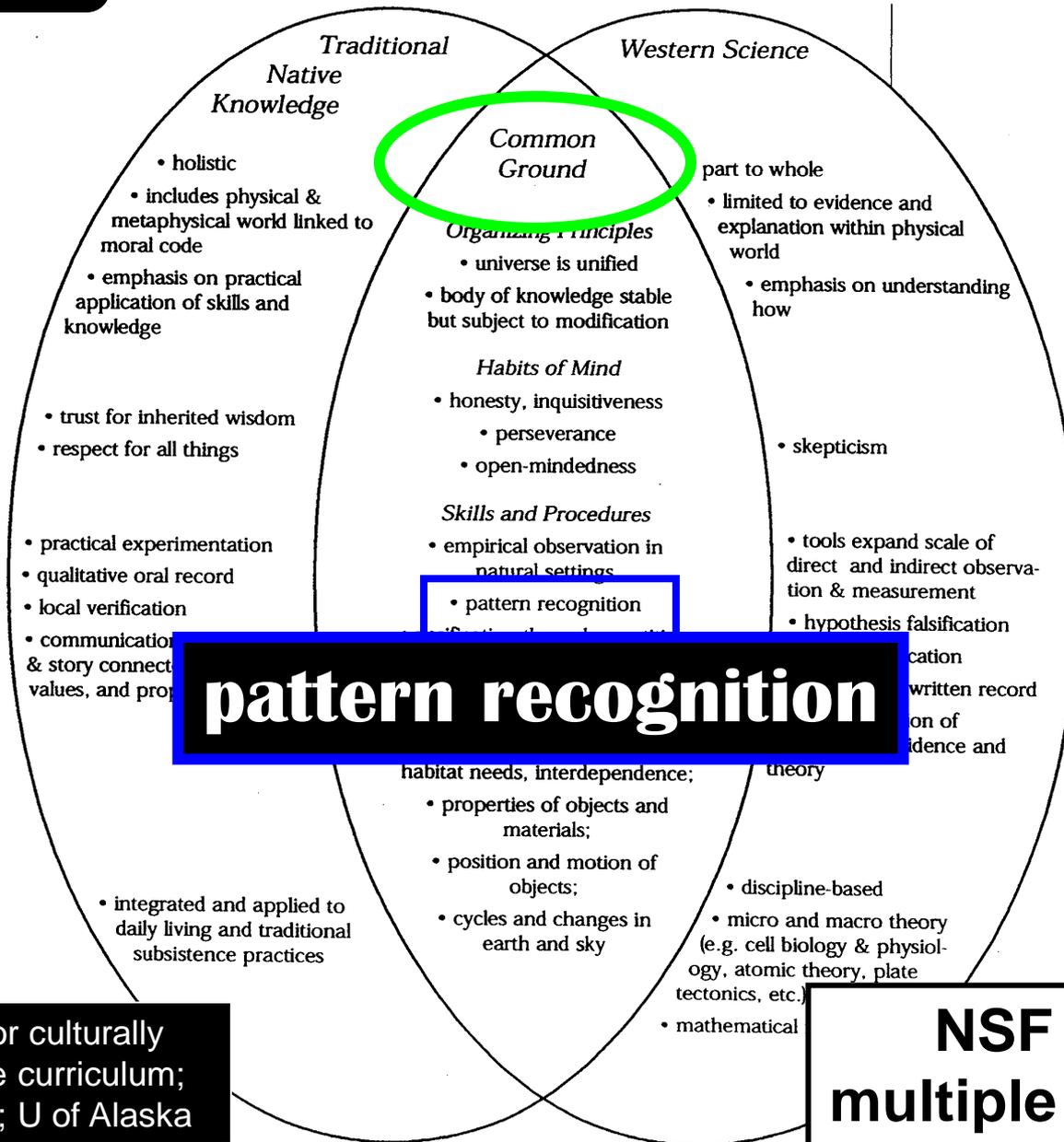
6



How?

6

SEEING COMMON GROUND Indigenous Knowledge & Western Science



pattern recognition

from: Handbook for culturally responsive science curriculum; S. Stephens, 2000; U of Alaska

**NSF funding:
multiple millions \$\$\$**

How?

Integrative Framework

both Indigenous and Western, plus:

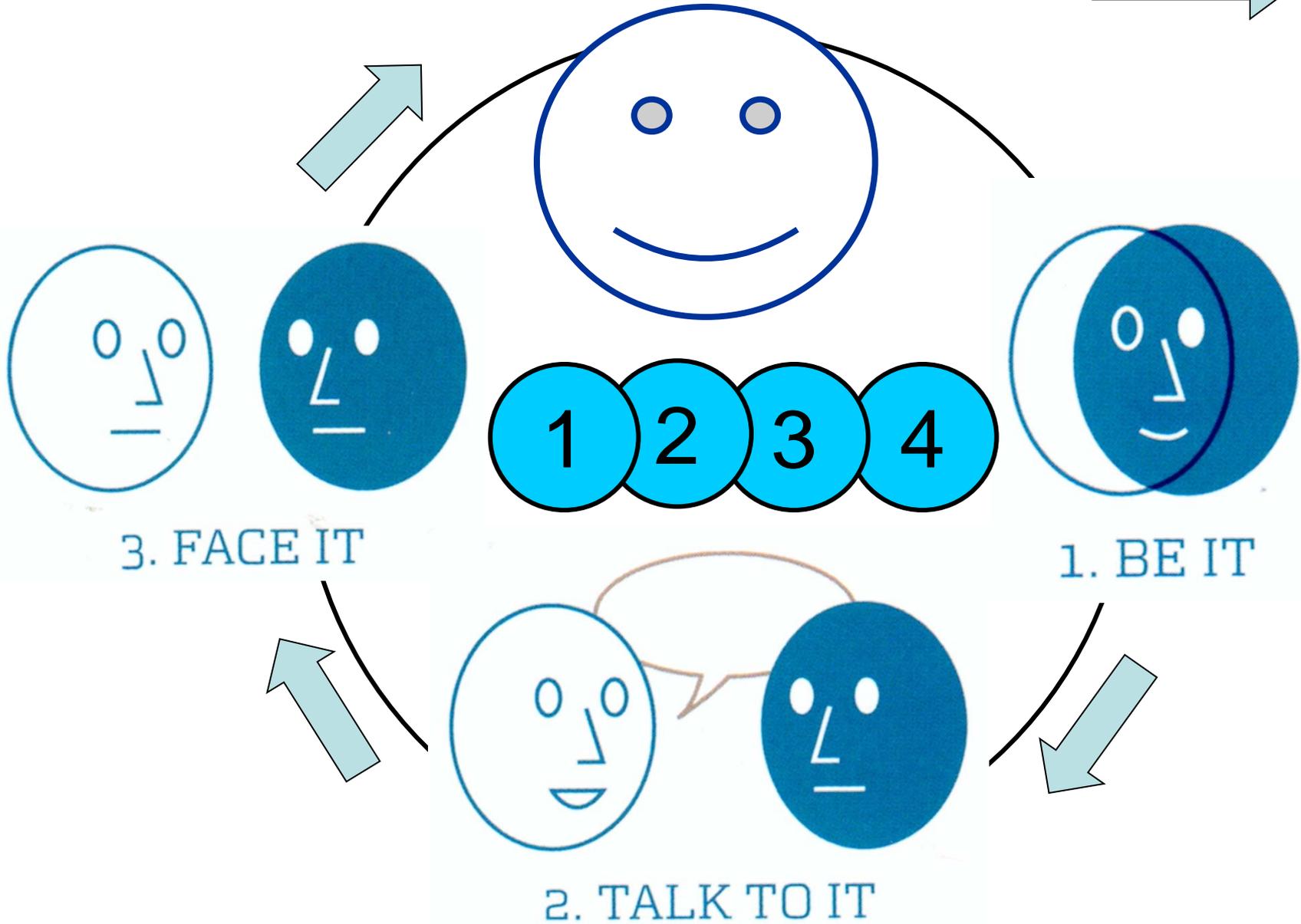
- our roles (you and me) in “the knowing”
 - patterns: recognition, transformation, expression
 - visuals
- our common ground
- our differences (and respect them)
- our journey ... forward & together

AVOID ... simply Western plus
bits and pieces of Indigenous

We must become able to put the “**know, do, value**” aspects of our worldviews in front of us ... like an object ... and then we must develop the abilities to walk around them ... to acknowledge them, take ownership of them, understand them, and put them beside those of another worldview ... to see our mutual strengths and to begin working together in a reciprocally respectful manner.



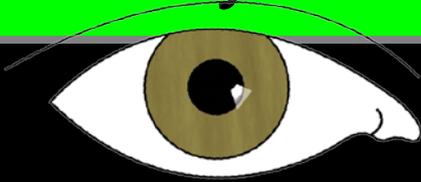
4. "KNOW, VALUE, and DO" IT ... SHARE IT ... and GROW IT



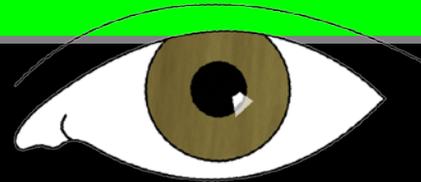
1

Two-Eyed Seeing

our key concepts & actions



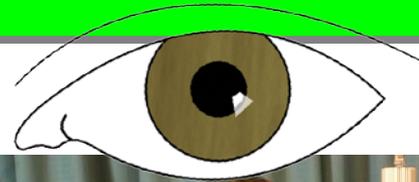
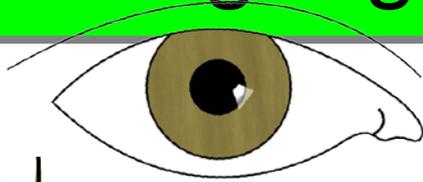
- respect
- relationship
- reverence
- reciprocity
- ritual (= ceremony)
- repetition
- responsibility



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

2

Two-Eyed Seeing our language & methodology



vigour

WEAVING



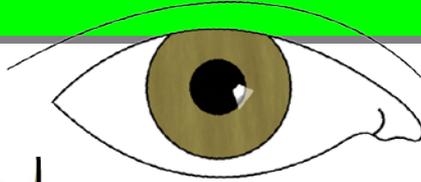
rigour

UN-WEAVING

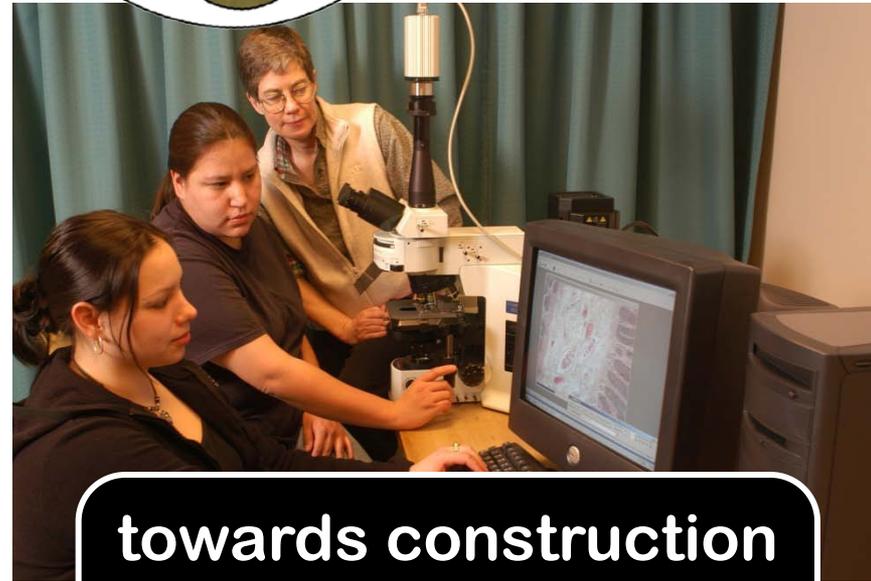
3

Two-Eyed Seeing

our overall knowledge objective



towards resonance
of understanding
within environment

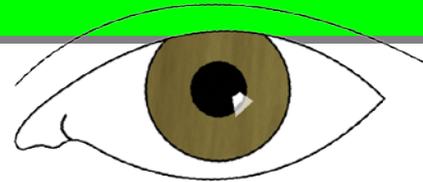
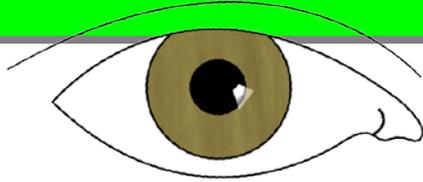


towards construction
of understanding
of environment

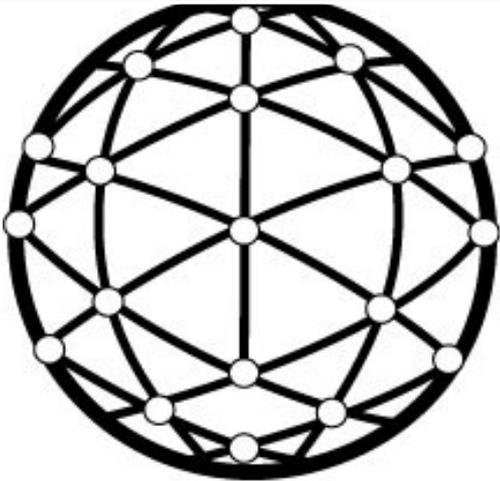
4

Two-Eyed Seeing

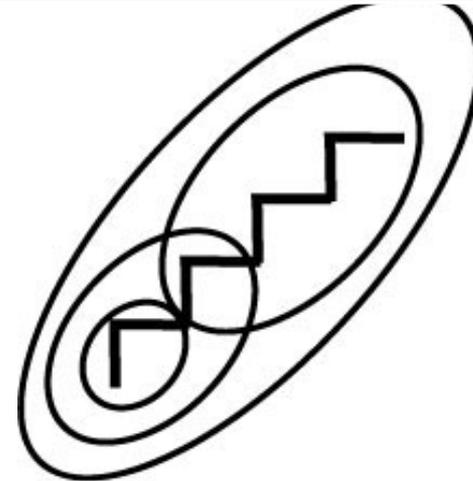
how our world is



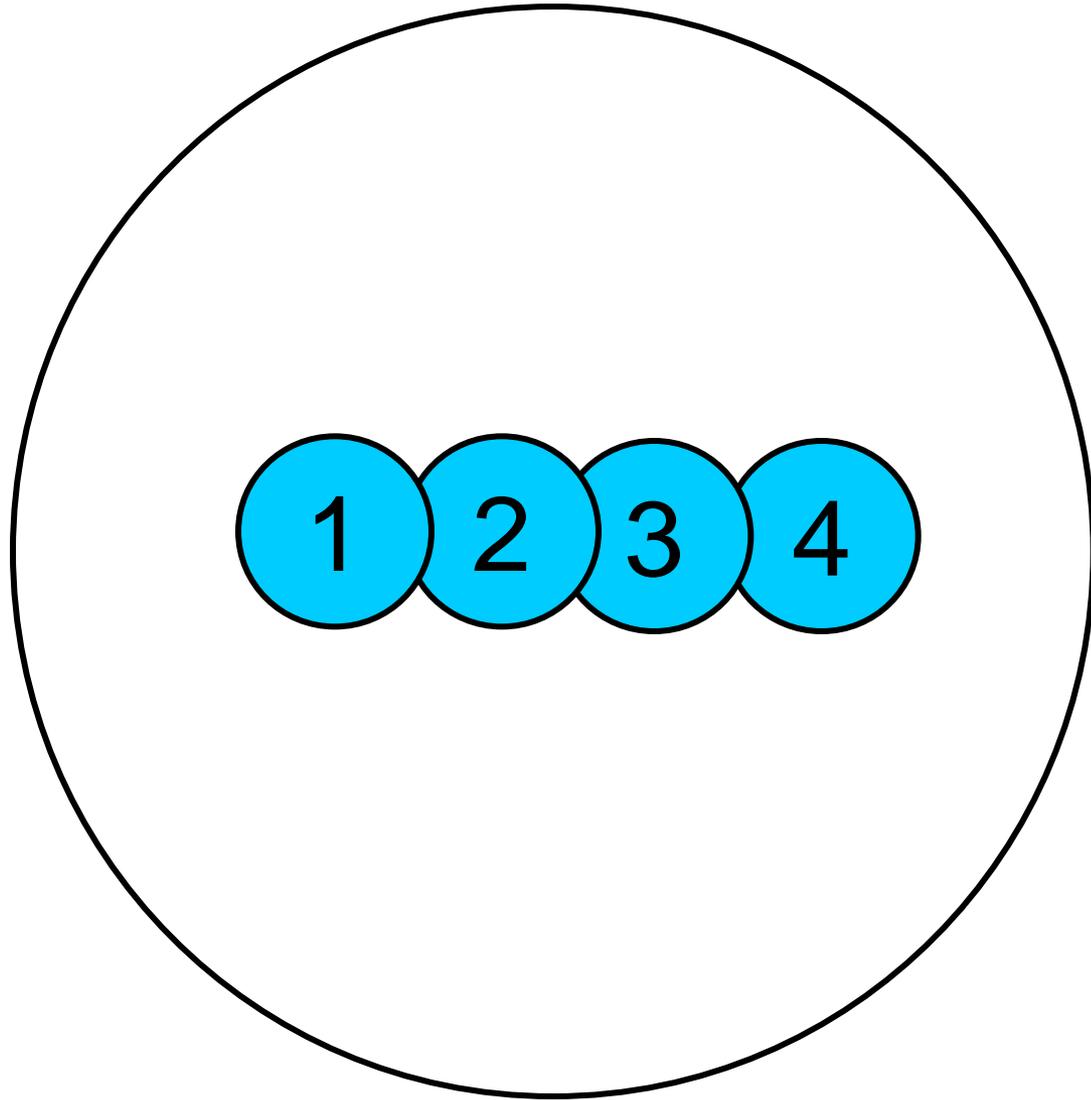
interconnective



parts & wholes



role of the knower in the knowing

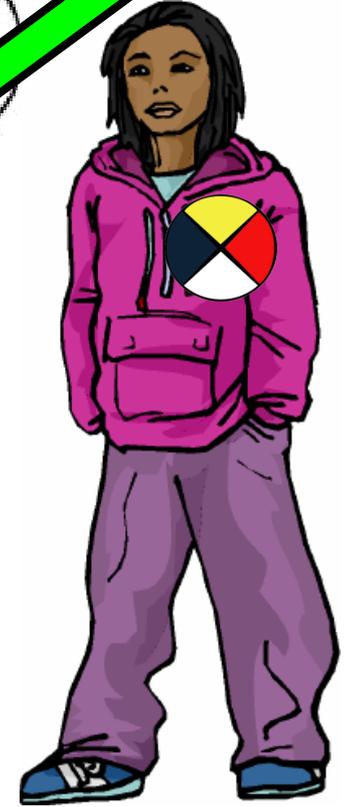
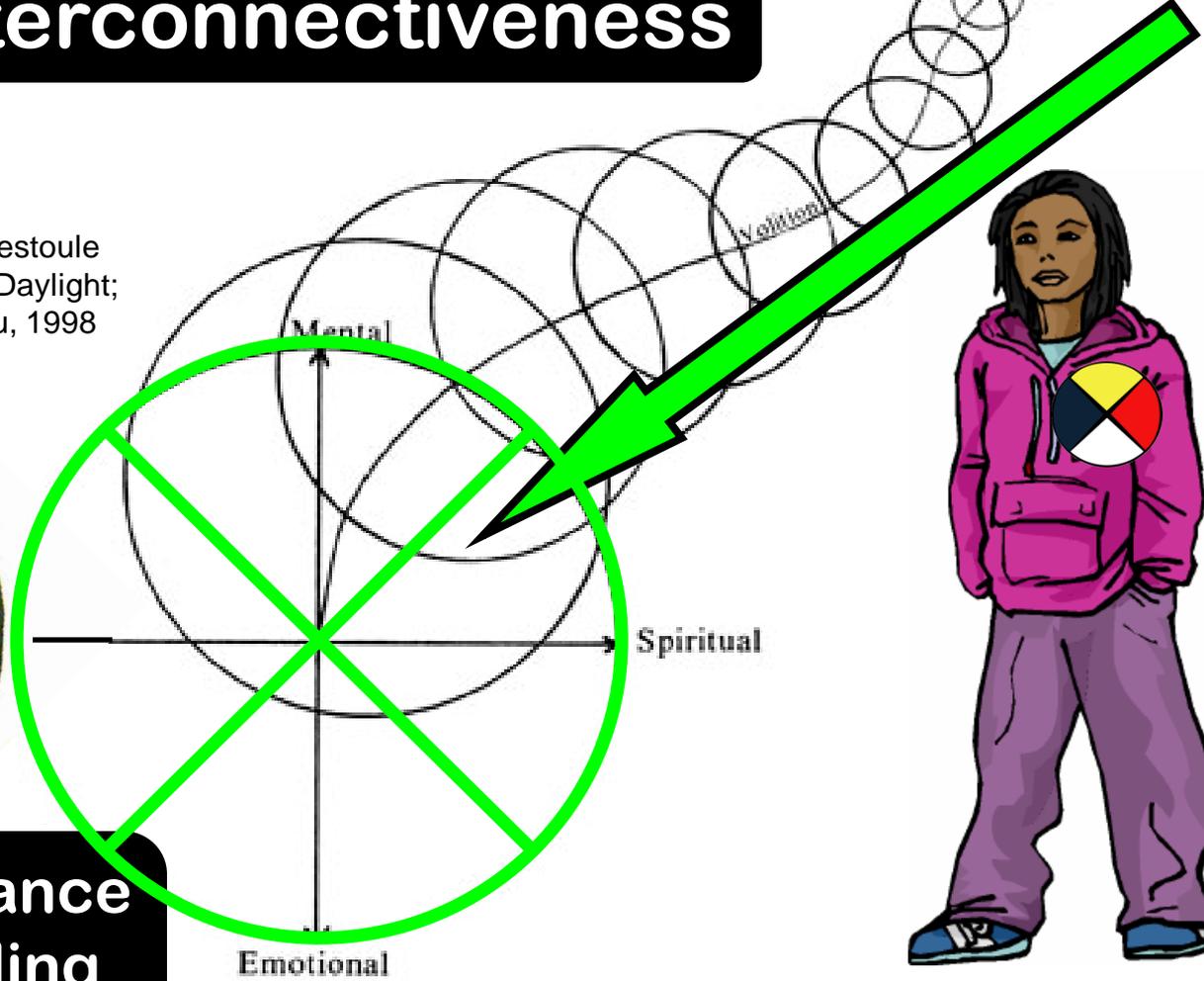


stories of:

interconnectiveness

Vision 

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



**towards resonance
of understanding
within environment**

"all my relations"

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



CIHR IRSC / Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Wela'liog / Thank you

IWK Health Centre Foundation

IAPH

ATLANTIC ABORIGINAL Health Research Program

Mi'kmaq Elders

NOVA SCOTIA Health Research FOUNDATION

SABLE OFFSHORE ENERGY INCORPORATED

UNAMA'KI INSTITUTE OF NATURAL RESOURCES

KECCA Knowledge: Education and Cultural Consultant Associates

NSERC CRSNG

Mi'kmawey Debert

Royal Canadian Mounted Police / Gendarmerie royale du Canada