

# CURRICULUM DESIGN FOR CREATIVE AND CRITICAL THINKING



Glen Thielmann • <http://thielmann.ca>  
SD42 Curriculum Implementation • Jan 25, 2019



# CURRICULUM DESIGN FOR CREATIVE AND CRITICAL THINKING



The Donella Meadows Project  
Academy for Systems Change

ABOUT | WORKS OF DONELLA MEADOWS | RESOURCES

## Systems Thinking Resources

### See our Systems Thinking Resources below!

Concepts and Frameworks

#### THE FIVE LEARNING DISCIPLINES

Developed by renowned systems thinker [Peter Senge](#), these five disciplines each enhance the ability of a person or organization to use learning effectively. Leveraged together, they contribute heavily to the success of learning organizations, defined by Senge as, "...organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together."

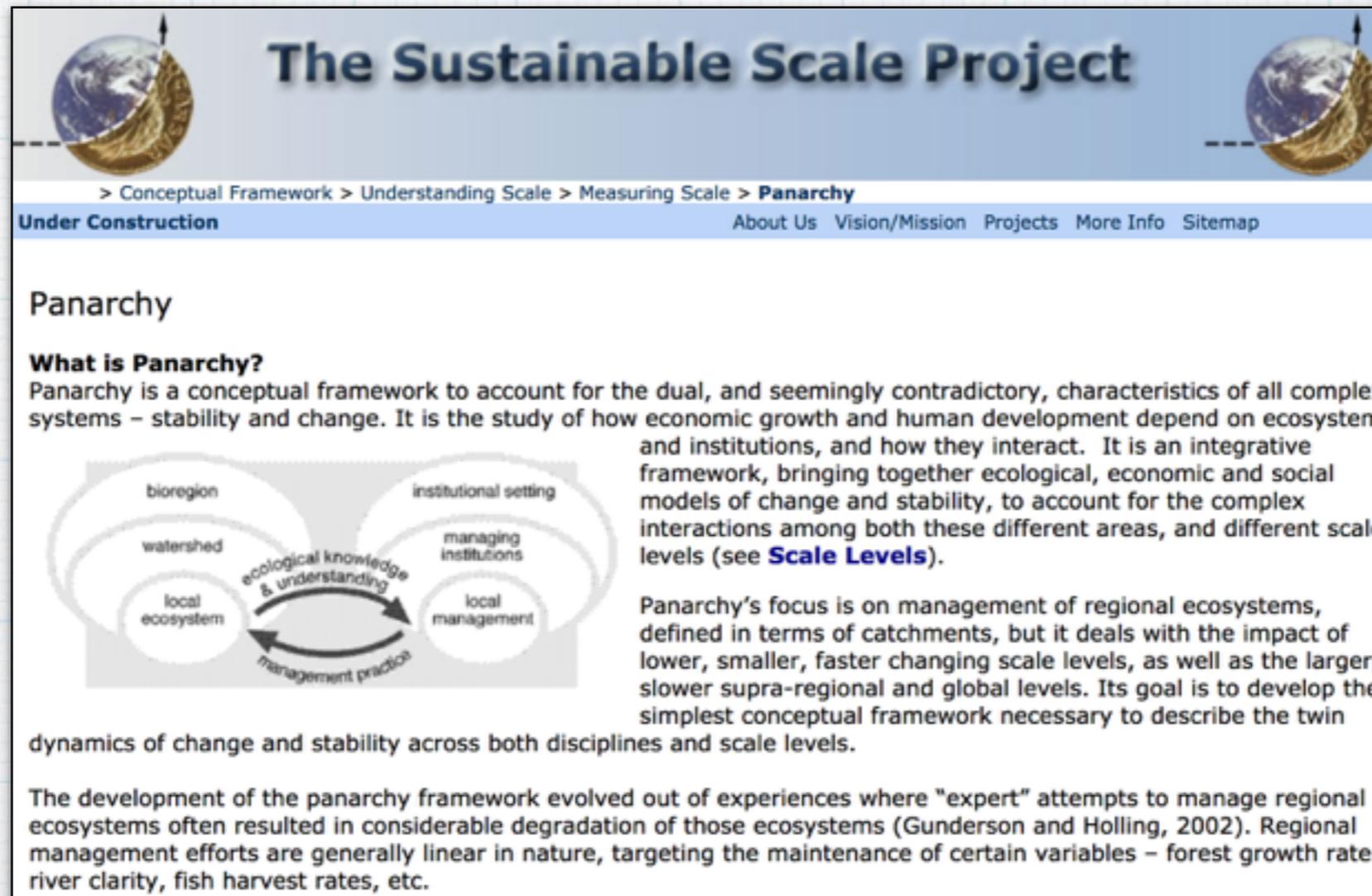
The five learning disciplines are

1. Personal Mastery
2. Mental Models
3. Shared Vision
4. Team Learning
5. Systems Thinking

- \* U-Process (Theory U)
- \* Biomimicry
- \* Double Loop Learning
- \* Iceberg Model
- \* Bathtub Theorem
- \* Stock and Flow Diagramming
- \* Open Space
- \* World Café
- \* Graphic Facilitation
- \* Guided Envisioning (of a Sustainable World)

<http://donellameadows.org/systems-thinking-resources/>

# CURRICULUM DESIGN FOR CREATIVE AND CRITICAL THINKING



The Sustainable Scale Project

> Conceptual Framework > Understanding Scale > Measuring Scale > **Panarchy**

Under Construction About Us Vision/Mission Projects More Info Sitemap

## Panarchy

**What is Panarchy?**  
Panarchy is a conceptual framework to account for the dual, and seemingly contradictory, characteristics of all complex systems – stability and change. It is the study of how economic growth and human development depend on ecosystems and institutions, and how they interact. It is an integrative framework, bringing together ecological, economic and social models of change and stability, to account for the complex interactions among both these different areas, and different scale levels (see **Scale Levels**).



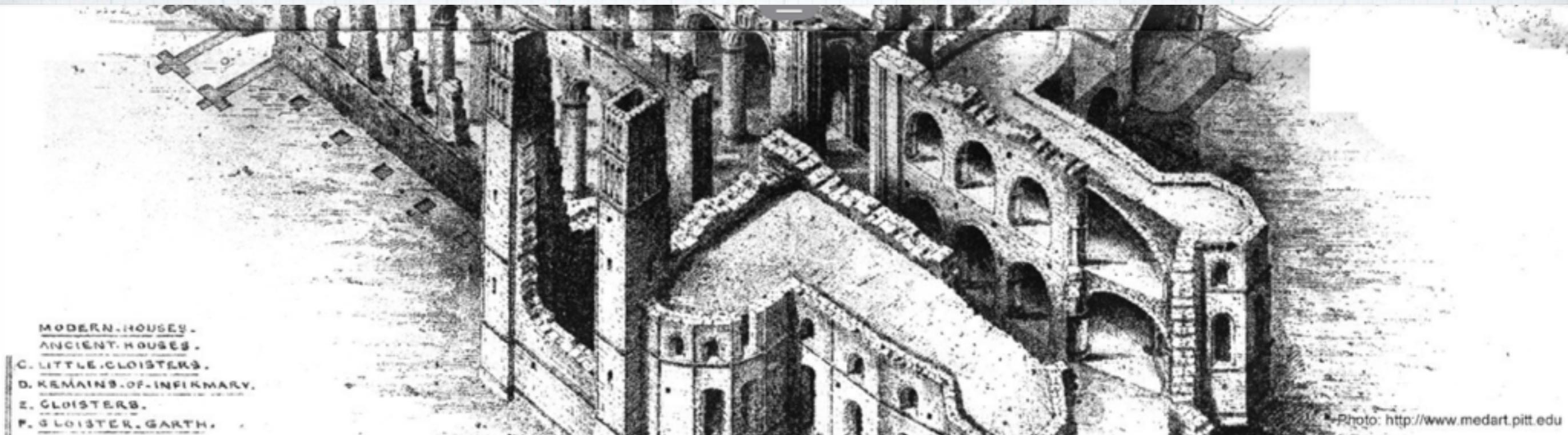
The diagram illustrates the Panarchy framework with nested scales and interactions. On the left, three nested circles represent scales: 'local ecosystem' (innermost), 'watershed' (middle), and 'bioregion' (outermost). On the right, two nested circles represent institutional levels: 'local management' (innermost) and 'institutional setting' (outermost). A double-headed arrow between the 'local ecosystem' and 'local management' circles is labeled 'ecological knowledge & understanding' (top) and 'management practices' (bottom).

Panarchy's focus is on management of regional ecosystems, defined in terms of catchments, but it deals with the impact of lower, smaller, faster changing scale levels, as well as the larger, slower supra-regional and global levels. Its goal is to develop the simplest conceptual framework necessary to describe the twin dynamics of change and stability across both disciplines and scale levels.

The development of the panarchy framework evolved out of experiences where "expert" attempts to manage regional ecosystems often resulted in considerable degradation of those ecosystems (Gunderson and Holling, 2002). Regional management efforts are generally linear in nature, targeting the maintenance of certain variables – forest growth rates, river clarity, fish harvest rates, etc.

**Design Thinking based on the need to manage natural resources where the existing expert approaches and competing interests were not working.**

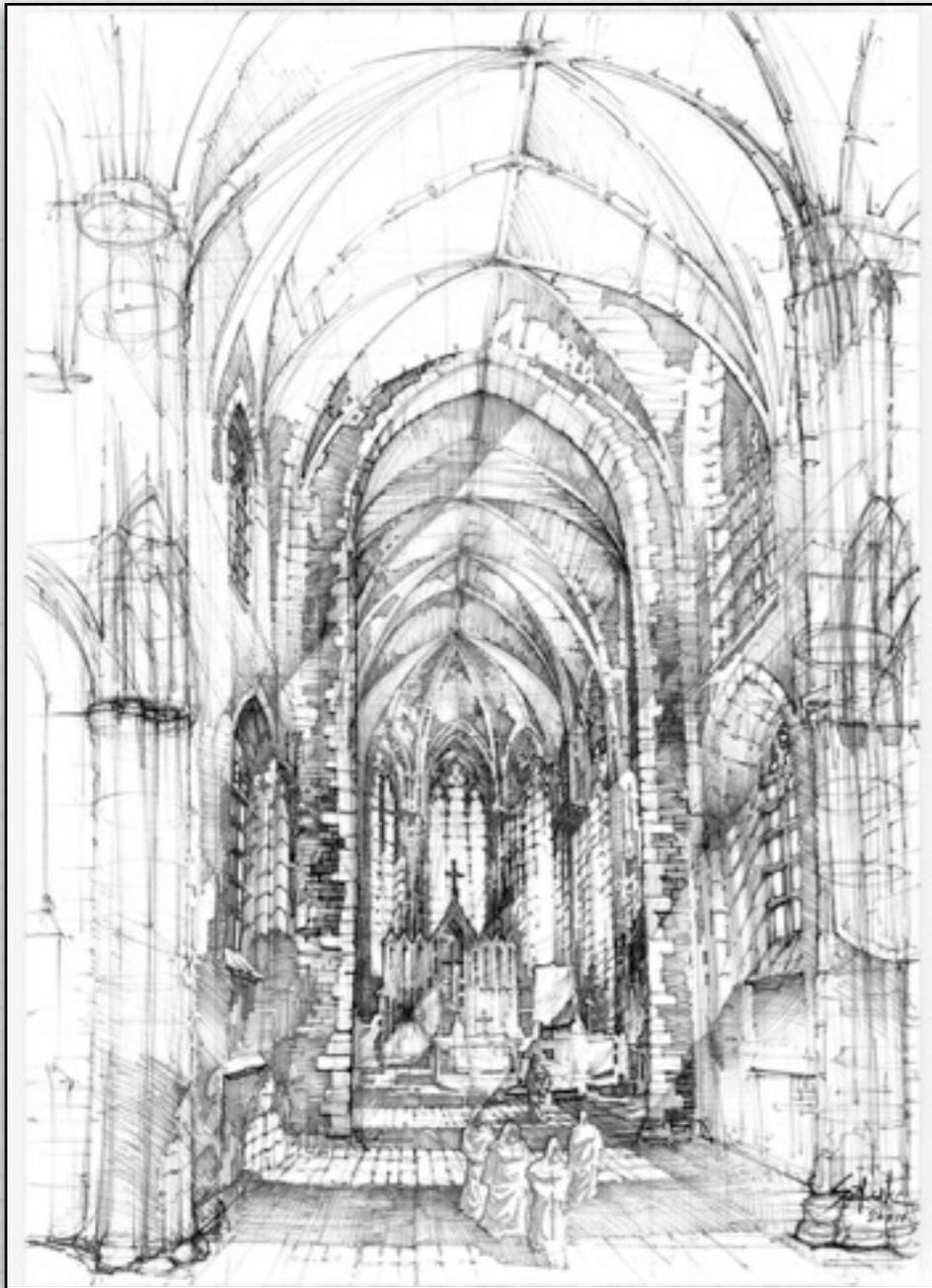
# CATHEDRAL THINKING



## Cathedral Thinking and Education, from <https://cathedralthinking.com>

Cathedral Thinking” is that the creation of a significant sustained initiative, like the construction of a cathedral that will take a very long time to complete. In the case of cathedrals this will likely be several hundred years, much longer than the lifetime of those who started it. To undertake such a long term, demanding and potentially Evolutionary endeavour requires strategic innovations and strategic systems that are entirely different from those that deal with mundane day-to-day problems. Courage, vision and commitment is mandatory.

# CATHEDRAL THINKING



OK, maybe not centuries, but think in terms of 30 years before you think of the next 3 days.

Community (network) approach with strong role for experts

Planning for long-term uses that are different than the immediate needs and challenges

Project may never really be completed, but at some point it needs to be used — therefore the planning starts with intention, the broad goals for how the space will be experienced and the expected outcomes from people who use it.

- TEACHER IDENTITY**
- passion, strengths, goals/values, wish-lists, force of personality
  - my story - personal & cultural narratives
  - influence of other educators, peers, and supervisors, network
  - influence from students (e.g. what you think you've learned from them that will influence current or future learning design)
  -

- ASSESSMENT**
- formative (formal/informal) & summative assessment
  - entry level & pre/post assessments
  - performance standards/rubrics/proficiency scales
  - reflection cycle for students and teacher
  - real-world/authentic assessment
  -

- STRUCTURES & ROUTINES**
- start and end points (e.g. content, timeline)
  - norms & expectations
  - hook(s) - overarching/ongoing vs set of daily prompts
  - kinds and number of lessons (dividing a unit into parts)
  - pedagogical balance (talk vs read vs move vs view, etc.)
  - matching learning resources (old & traditional vs newer & tested vs newest & experimental), design for quick engagement (cool) vs depth or importance
  - classroom traditions or habit-forming practices (for teachers and students)
  - style and expression options for students (e.g. multimodal)
  - flex time, pacing for lesson elements
  - question techniques, varied methods for encouraging response
  - backup activities, go-bag for subs
  - assignment design, digital or print support (e.g. handouts)
  - making space for all voices, perhaps starting by considering Indigenous learners, ELL learners, aiming for equity
  -

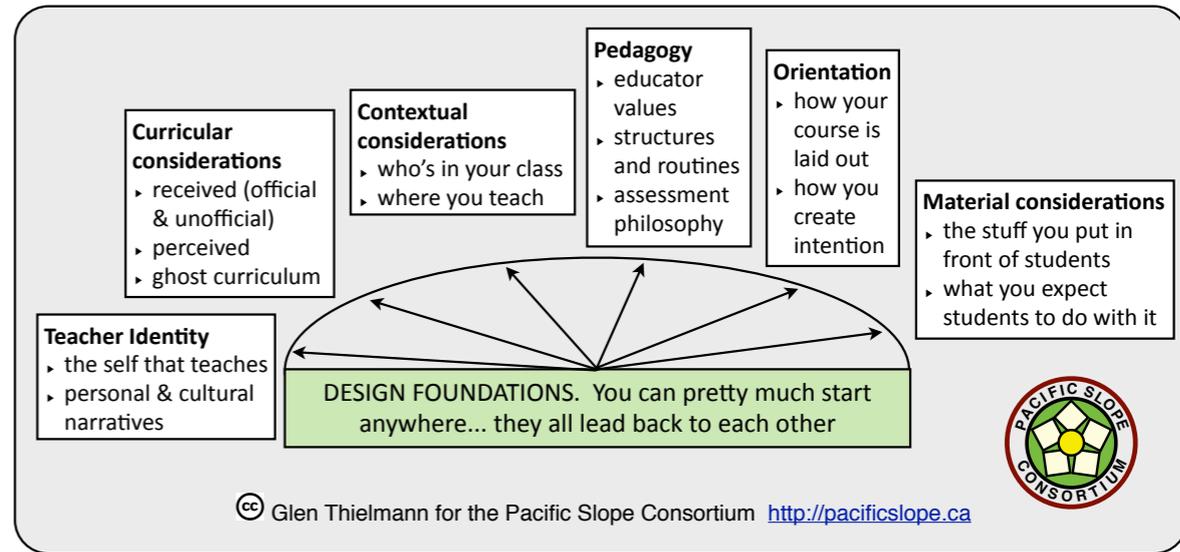
- SHAPING CONTEXT**
- social-emotional factors, self-regulation
  - embedded classroom management strategies
  - indigenizing spaces - environments of care, inclusion, mindfulness, and paying attention to the needs of the body, mind, and soul
  - social contexts: individual, group, student vs teacher led, guests
  - environmental contexts: indoor vs outdoor, class, library, lab, gym
  - classroom design: the "pattern language" of desks, tables, configuration, patterns, shelves, reggio-inspired, order vs chaos, stations, centres, circles, "feng shui"
  - strategies for clean & safe work areas
  - social contexts: individual, group, student vs teacher led
  - community and place-conscious opportunities, and guests!
  - environmental contexts: indoor vs outdoor, class, library, lab, gym
  - classroom design: desks, tables, configuration, patterns
  - classroom presence: where is the teacher, why there
  -

- VALUES & PEDAGOGY**
- educator beliefs (e.g. what is this course about)
  - educational or developmental theory (e.g. attachment, inquiry-based approach, growth mindset, constructivism, Bloom's taxonomy, pedagogy of the oppressed)
  - First Peoples Principles of Learning and/or variants
  - BC College of Teachers Standards
  - values of inquiry (clarity, accuracy, precision, depth, coherence, breadth)
  - Universal Design for Learning, backwards design \* differentiation
  - cognitive skills (e.g. interpretation, analysis, evaluation, inference, explanation, metacognition)
  - Wholistic Learning Intentions (over/above or complimentary to official curriculum)
  - multiple intelligences & learning styles (teaching style)
  - notions of actualization & world-views (what kinds of humans are we making, what do I believe about students)
  -

## THE INGREDIENTS OF COURSE AND UNIT PLANNING

- WHAT ELSE?**
- - 
  - 
  - 
  -

- CURRICULUM**
- Curriculum Goals & Rationale documents
  - Curriculum Core Competencies
  - Curriculum Big Ideas
  - Curriculum Curricular Competencies
  - Curriculum Content Standards
  - how much or little, where to put it and why
  -



# ASKING CATHEDRAL QUESTIONS

**What is the purpose of Social Studies?**



# What is the purpose of Social Studies?

## **HISTORICAL LITERACY**

Becoming knowledgeable about the themes, events, facts, and phenomenon that have shaped our society. Familiarity with key historical narratives and timelines and an appreciation for how the past informs the present.

## **MAKE / DO / INQUIRE**

Practicing and building skills such as research techniques, map reading and making maps, charts, graphs, reading for understanding, writing for an audience, debating, constructing models, experimenting with role-play/simulations, completing an inquiry or project-based cycle, etc.

## **PLACE-BASED**

Authentic learning draw powerful benefits from deep connections to place. Whether this means a human or natural environment, a context for learning, a landscapes, community, homeland or traditional territory, place is intertwined with all aspects of personal and cultural identity.

## **ACTIVE CITIZENSHIP**

Creating informed, engaged, and critical citizens who are literate about global issues, can defend opinions about current events and take stances on social justice and environmental issues, and are future-focused and willing to work towards change.

## **CRITICAL THINKING**

Developing capacity to interpret, apply logic & thinking concepts, wrestle through problems, and express oneself when faced with a variety of challenging historical or geographic evidence. A “thinking classroom” where cognitive skills are front and centre.

## **IDENTITY WORK**

Setting up students to explore self in regards to society, the world, and the Other. Establishing empathy, interconnectedness, and ability to tell one’s own story and hear the stories of others. Social Studies is interdisciplinary and often quite personal.

## **RECONCILIATION**

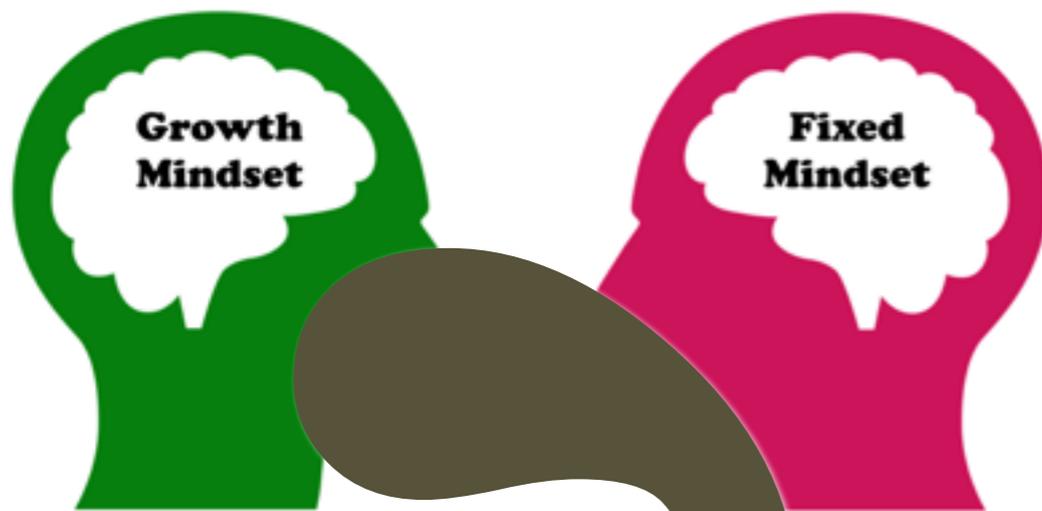
Inspired by the urgent need to achieve indigenous reconciliation, students are challenged to understand and respond to indigenous perspectives, legacies, and avenues for positive change. Coming to grips with First Peoples’ experience of Canada is essential to any future vision of “being Canadian.”

## **CULTURAL MOSAIC**

Answer the question of what it means to live in a pluralistic society that has its roots in European and Indigenous cultures but has changed rapidly in the last few decades. Develop understanding and respect for all cultures in Canada and imagine what sustainable communities could look like. Strong roles for heritage studies and current events.

# OLD GROWTH MINDSET

## What Kind of Mindset Do You Have?



The infographic features two stylized human heads. The left head is green and contains a white brain shape with the text 'Growth Mindset'. The right head is pink and contains a white brain shape with the text 'Fixed Mindset'. A large, dark grey question mark is overlaid on the infographic.

**Growth Mindset**

- I can learn anything I want to.
- When I'm frustrated, I persevere.
- I want to challenge myself.
- When I fail, I learn.
- Tell me I try hard.
- If you succeed, I'm inspired.
- My effort and attitude determine success.

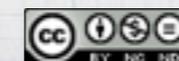
**Fixed Mindset**

- I'm either good at it, or I'm not.
- When I'm frustrated, I give up.
- I don't like to be challenged.
- Being smart is no good.
- Being smart.
- When I fail, I feel threatened.
- My intelligence and talent determine everything.

© 2014 by foragingpaths. All rights reserved. Icons from themountainproject.com



<https://carolondenman.wordpress.com/2015/06/28/an-ancient-forest/>



# OLD GROWTH MINDSET



**Ecosystem Theory in Education suggests that the relationships existing in learning environments are essentially ecological in nature**

**Forest examples:**

- \* intensely connected to the characteristics of place**
- \* interrelatedness of factors affecting performance**
- \* development of niches (specialization)**
- \* interspecies cooperation (e.g. mycelial network)**
- \* community indicator species**
- \* continuous decay and renewal within set patterns**
- \* old growth specimens: the denizens of the forest with impacts that extend well beyond death**

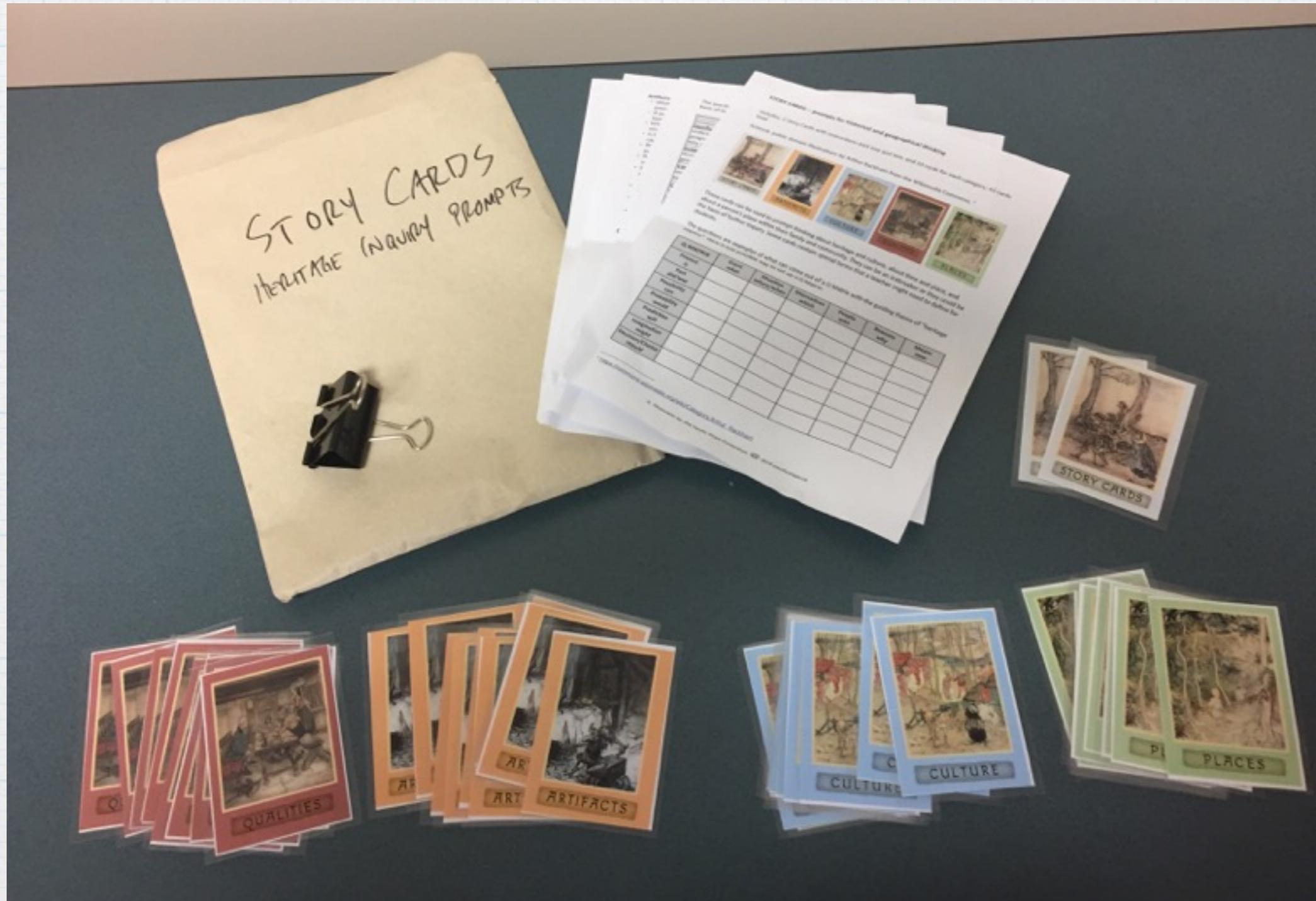
**Views the classroom as an ecosystem with necessarily different functions (niches) but focused on long-term health and diversity of the community**

# ECOLOGICAL NATURE OF HERITAGE AND CULTURE

**Heritage Inquiry is an effective way to develop ecological structures in a classroom**

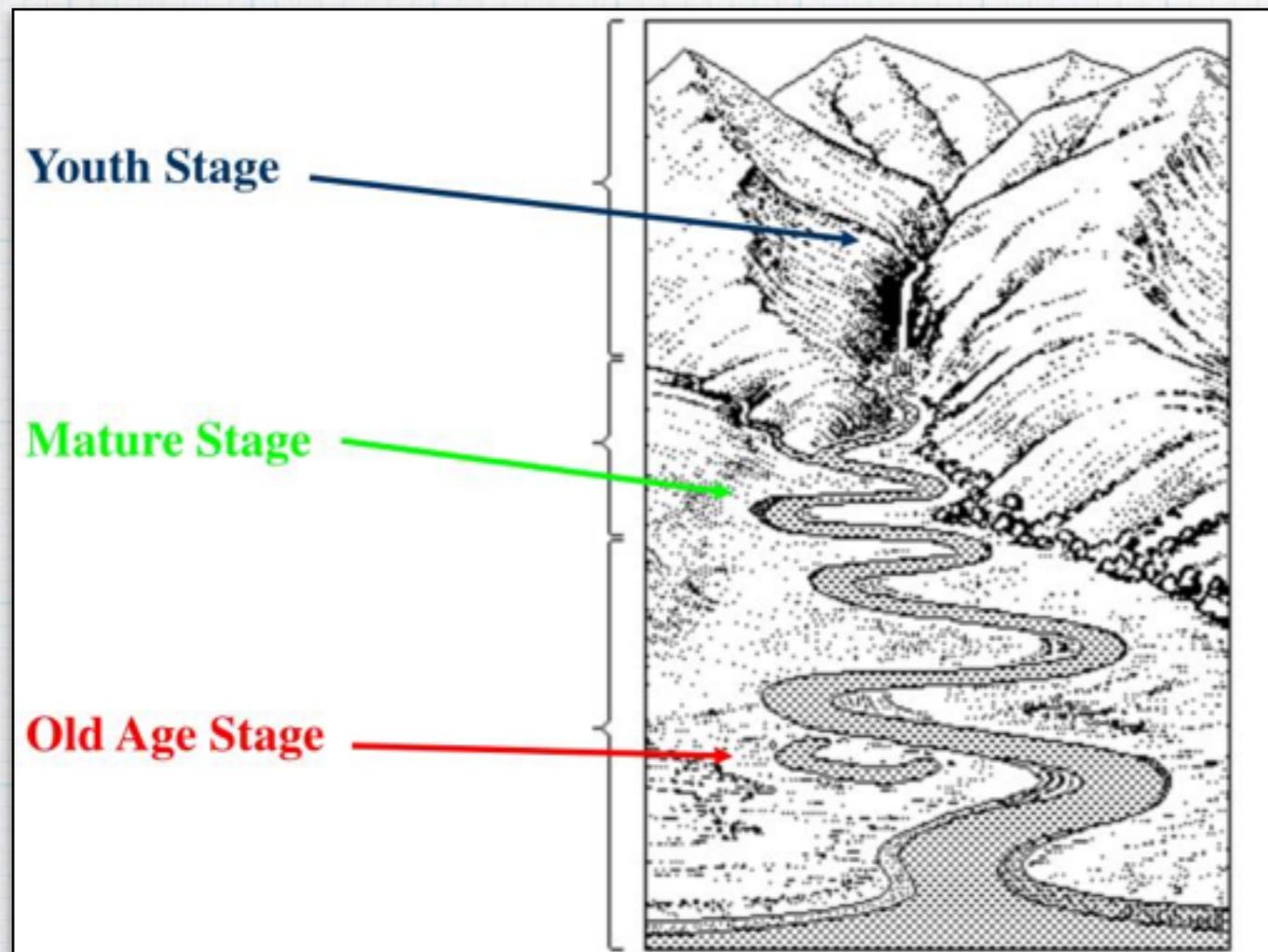
- \* firm role for teachers and community members (especially elders) to act as “denizens” — intergenerational informants, and a powerful source of nutrients for the classroom soil**
- \* create niches for students to specialize and succeed where otherwise they might not**
- \* inquiry process acts as a fungal network providing nutrients along the root network — students learn from each other**

# HERITAGE INQUIRY



Rivers are complex systems:

# FLUVIAL MODEL



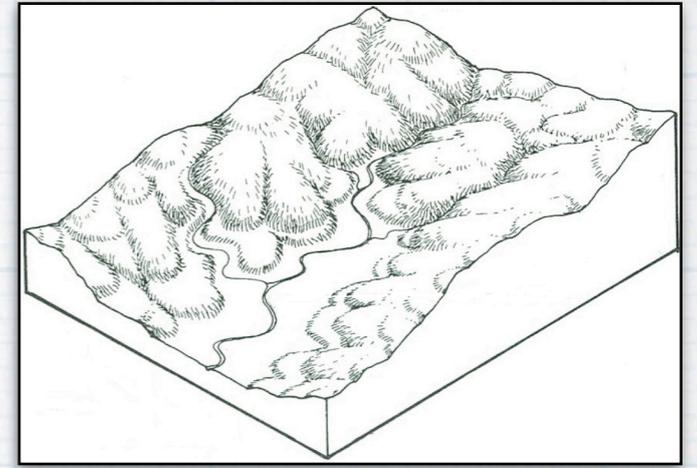
- \* in the youthful stage, they have the ability to cut down quickly through substrate, but remain small and subject/ responsive to sudden changes

- \* in their middle stage, they create an ever-widening path of influence, their own distinct landscape & ecosystem

- \* in their older stage, they don't carve vertically through mountains but they do carry mountains of sediment and have enormous horizontal impact

# FLUVIAL MODEL

## THINK LIKE A RIVER



### Competence vs Capacity

- \* fluvial geomorphologists differentiate between stream competence (ability to move particles by size) and stream capacity (total volume of sediment able to be carried)
- \* for a class to think like a river, their needs to be trust and community
- \* trust — that the youthful and the experienced each do their part
- \* community — if each does their part then the whole system has significant impact and ability to accomplish goals



# What we learn, why we learn it, and how it will be assessed in Social Studies

introducing the "CAPACITIES"

**Foundations**  
ability to comprehend and organize subject/course related knowledge and understandings

**Skills**  
ability to apply hard & soft skills and successful habits or mindsets in Social Studies

**Thinking**  
ability to use critical thinking concepts with source evidence in order to draw conclusions

**Connection**  
ability to express findings, respond to inquiry, synthesize and apply learning in real time

**"I can" STATEMENTS**

*I know about themes and examples from history, geography, and society.*

*I have a sense of the world in which I live and my story within it.*

*I apply what I have learned to theoretical and real-world problems.*

*I have picked up skills and found the relevance in Social Studies.*

*I interpret, form opinions, and gain understanding from data and evidence.*

*I have a sense of how human nature has played out on the world.*

*I follow different kinds of inquiry steps and express my learning effectively.*

*I make authentic connections to the stories of others.*

**KNOW / DO / UNDERSTAND**



++++ + ++  
**more about curricular content, acquiring knowledge, and breaking down the big ideas**



++ +++++ +  
**more about applying the skills aspect of the curricular competencies to content-related problems**



+ +++++ +  
**more about using the critical thinking aspects of the competencies to understand the big ideas**



++ ++ +  
**more about putting both competencies and content to work to show learning about the big ideas**

**EXAMPLES**

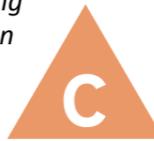
*categorization, annotated map, simulation game, lecture notes, lesson guides, group poster, response guide, question/answer (aka bookwork), test/quiz, graphic organizer, identifying arguments, read for understanding, pose questions of the curriculum*

*annotated timeline, thematic map, research outline, decoding activity, graphing exercise, GIS computer tutorial, bibliography, letter to the editor, socratic circle, debate, locating appropriate primary sources, deconstructing an argument or claim*

*current events response template; categorization of data by theme; analysis and comparison of primary sources such as statements, maps, records, paintings, letters, and photographs, evaluation of a claim; predicting geographic change; building an historical account*

*research essay, portfolio presentation, creative writing or artwork, embodied performance, class demonstration, use of driving questions and inquiry cycle, poster display and lecturette, response to an essential question, community action*

**CORE COMPETENCIES**



<--- personal & cultural identity, personal/social awareness & responsibility  
 <--- creative & critical thinking  
 <--- communication

**STRONG ROLE FOR...**

**KNOWLEDGE ORGANIZERS**  
e.g. exercises and activities structured around the curricular content standards

**COGNITIVE SKILLS**  
e.g. interpretation, analysis, evaluation, inference, explanation, self-regulation\*

**HISTORICAL AND GEOGRAPHIC THINKING CONCEPTS**

**VALUES OF INQUIRY**  
e.g. clarity, accuracy, precision, depth, coherence, breadth\*

\*see Ellerton Matrix: [bit.ly/2EitNk6](http://bit.ly/2EitNk6)

**All of it... anchored in educational beliefs**  
#pedagogy #identity #praxis [pacificslope.ca](http://pacificslope.ca)

Sample 5 point Proficiency Scale for assessing performance standards or assignment criteria	
1	work has begun but evidence of understanding still to come; skills & concepts may seem very challenging
<b>Emerging</b>	
2	work shows progress towards understanding, mistakes are common & necessary
<b>Practicing</b>	
3	work shows some understanding and increasing confidence with skills & concepts
<b>Developing</b>	
4	work shows solid understanding and flexibility between skills & concepts; new challenges sought
<b>Applying</b>	
5	work shows frequent mastery & versatility with skills & concepts; challenges accepted
<b>Extending</b>	

Curricular Competencies - recurring concepts	
through-out	use inquiry processes and skills to ask questions and develop understanding
	assess historic and geographic significance of events, actions, places, and people
	assess credibility and draw conclusions from a variety of evidence and source data
	characterize and compare continuities and changes across time and place
	understand how cause and consequence are related in a variety of contexts
	consider different perspectives on people, places, issues, and events
	make reasoned ethical judgments about past or present decisions and actions

# PACIFIC SLOPE

## APPLYING THE DESIGN THINKING

**Cathedral Thinking — planning projects that won't bear fruit for 5-10 years, e.g. Sourcebox project, Thinking it Through (book), Place in Education Symposium**

**Old Growth Mindset — creating class activities and structures that encourage niches, and traditions that run from year to year**

**Fluvial Model — our consortium, like our classrooms, runs the spectrum from workshop to congress... different "particle size challenges" balanced with overall capacity to affect learning and develop thinking.**

**We often find ourselves at the "braided stream" phase of the river... multiple shifting channels, choked with sediment.**

# PACIFIC SLOPE

## APPLYING THE DESIGN THINKING

**Tinker:** All students can think critically and creatively; using hands-on primary and secondary sources and artifacts provides multiple access points for students to do so, and suggest the way for broader community connections and applications of learning.

**Thinker:** All students are capable of using the six historical and geographic thinking concepts to make sense of their worlds and express their understanding; when done together this forms the basis of learning communities rooted in thinking.

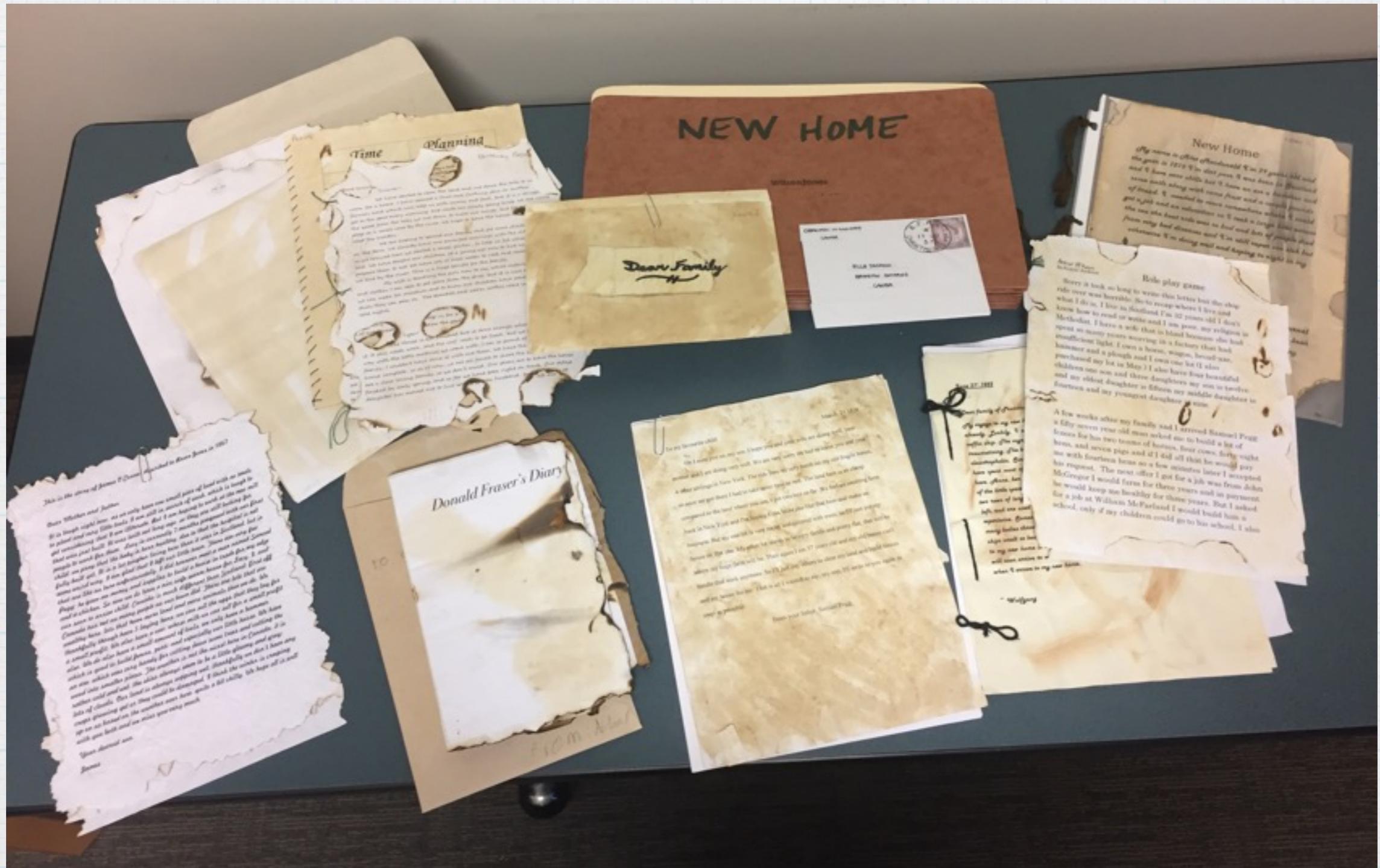
**Storyteller:** All students have powerful stories to tell, developed through techniques such as heritage inquiry and narrative writing; the roots of personal and cultural identity are intertwined with all aspects of curriculum

**PIE: Place in Education** — all learning is influenced strongly by context and deep connections to place, and is made more authentic when teachers and students work intentionally with notions of place.

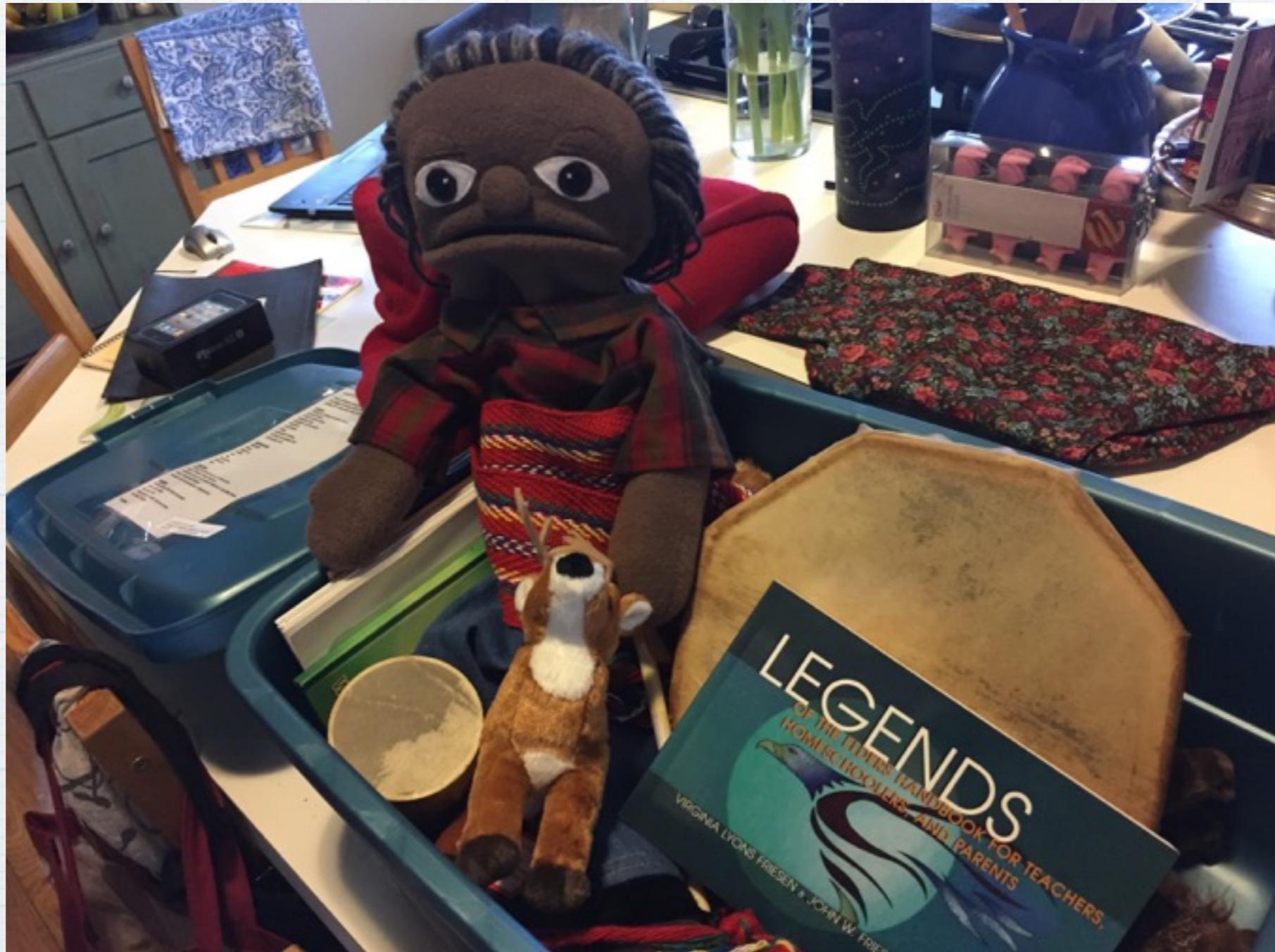
T  T  S  P 	Glen	Trina	Ian	Rob	JP	Joe
Role-play simulations	✓		✓	✓	✓	✓
Manipulative sets	✓			✓	✓	✓
Thinking classroom initiatives	✓	✓	✓	✓	✓	✓
Sourcebook Author	✓			✓	✓	✓
Heritage Inquiry Program	✓	✓	✓			✓
Place-based Songwriting		✓				
Integration of Outdoor Ed in SS			✓			
PIE planning & contribution	✓	✓	✓	✓	✓	✓
Other?						



# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



**Elders Project — using Métis kit to develop storytelling K-3**

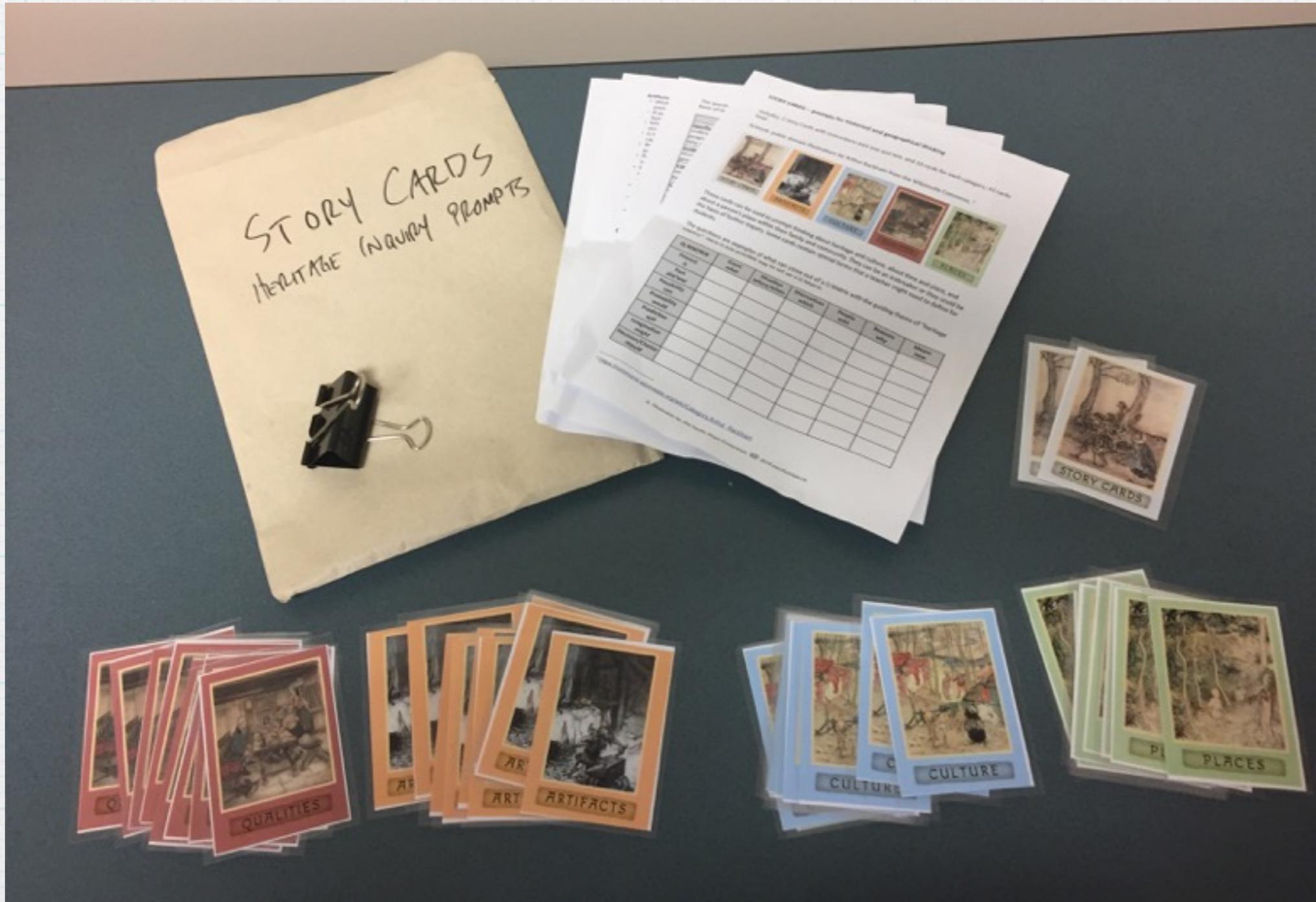
# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



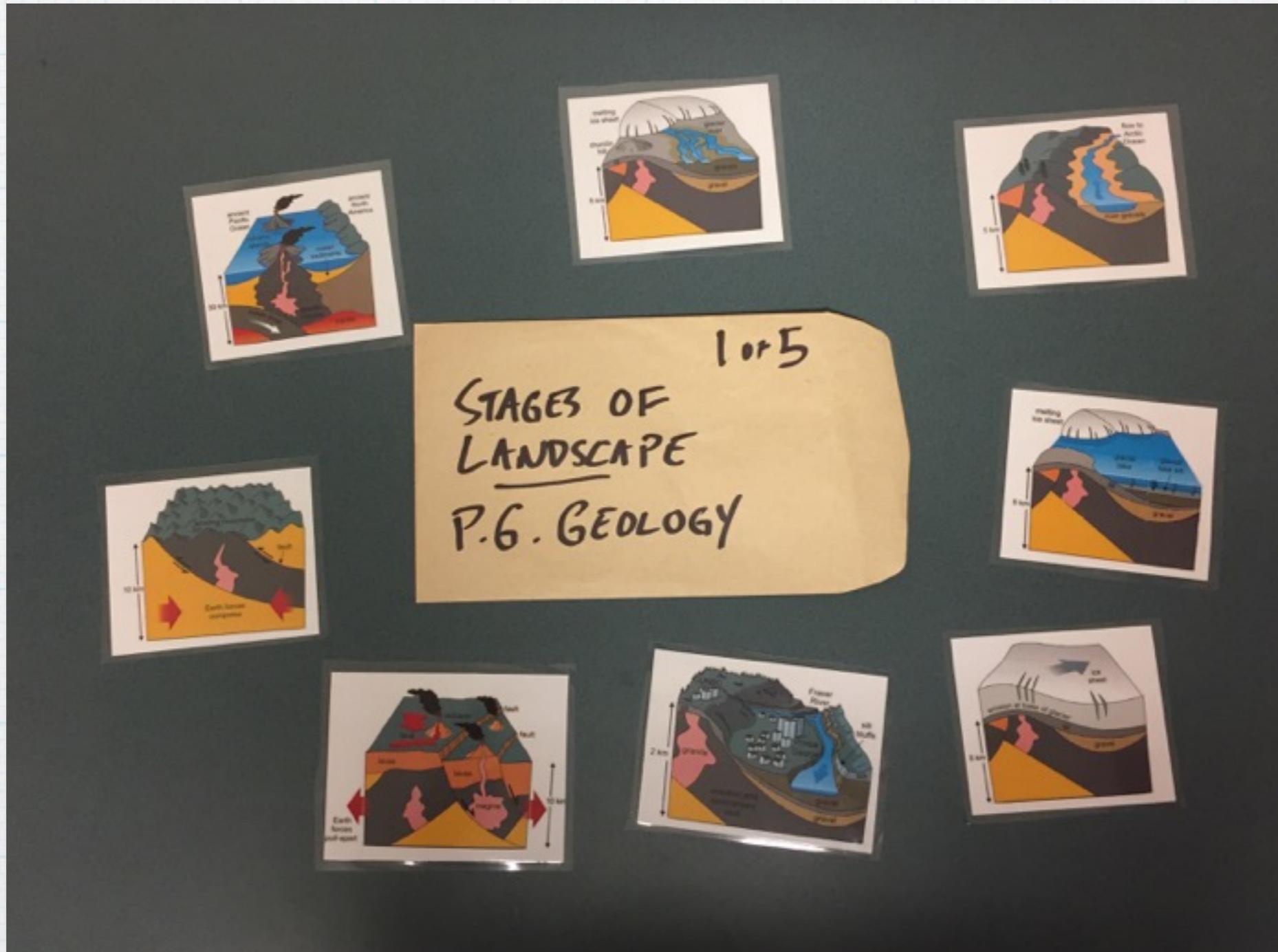
## Soviet Survivor



# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



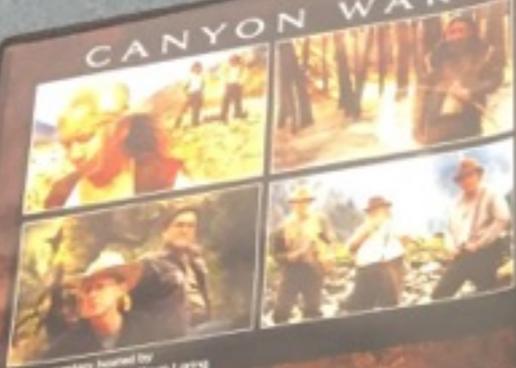
# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM







# CANYON WAR



A Documentary hosted by  
Dr. Daniel Marshall and Kevin Loring

Directed by **Eva Wunderman**

Filmed on location in the Fraser Canyon, British Columbia, Canada, the Canyon War sheds light on a shameful chapter of Canadian history: stories of villages in flames, bodies floating down river, and American miners killing and looting as desperate First Nations try to hold back hordes of rapacious gold-seekers flooding into their land. This isn't America's Wild West - it's British Columbia in 1858.

Descendants of the war's combatants, take you on a poignant journey to forgotten battlefields. From the battle of Boston Bar to the peace at Kumsheen, they show how the war's consequences are still being felt today.

53 min - FOR HOME USE ONLY

PRODUCERS: KIMBERLY WAINFELD / EVA WUNDERMAN / WALTER ZON BARRA / EXECUTIVE PRODUCER: DON HARRIS  
CO-PRODUCER: KEVIN LORING / OP: ROBERT FREED / EDITOR: KELLY MOORE / COMPOSER: ROB HEILINGSBARTH / GAIL SANCHEZ

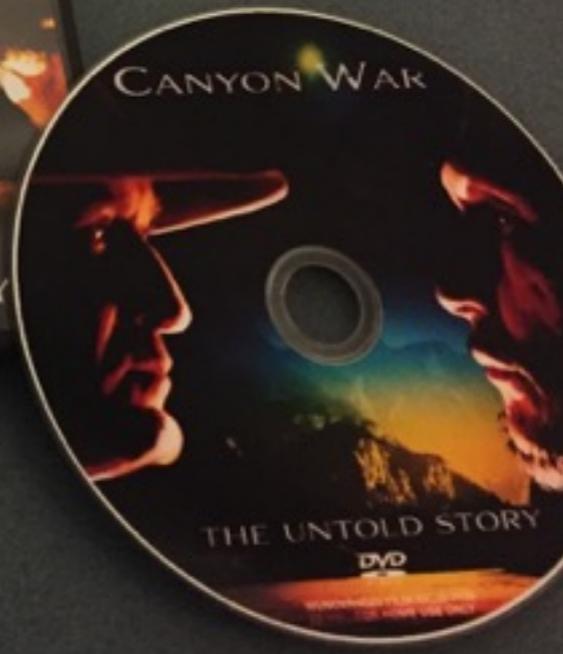
WITH THE PARTICIPATION OF PROVINCE OF BRITISH COLUMBIA FILM SOCIETY AS THE CANADIAN FILM BOARD PRODUCTION TAX CREDIT  
WUNDERMAN FILM INC. © 2009

Canada

# CANYON WAR



## THE UNTOLD STORY

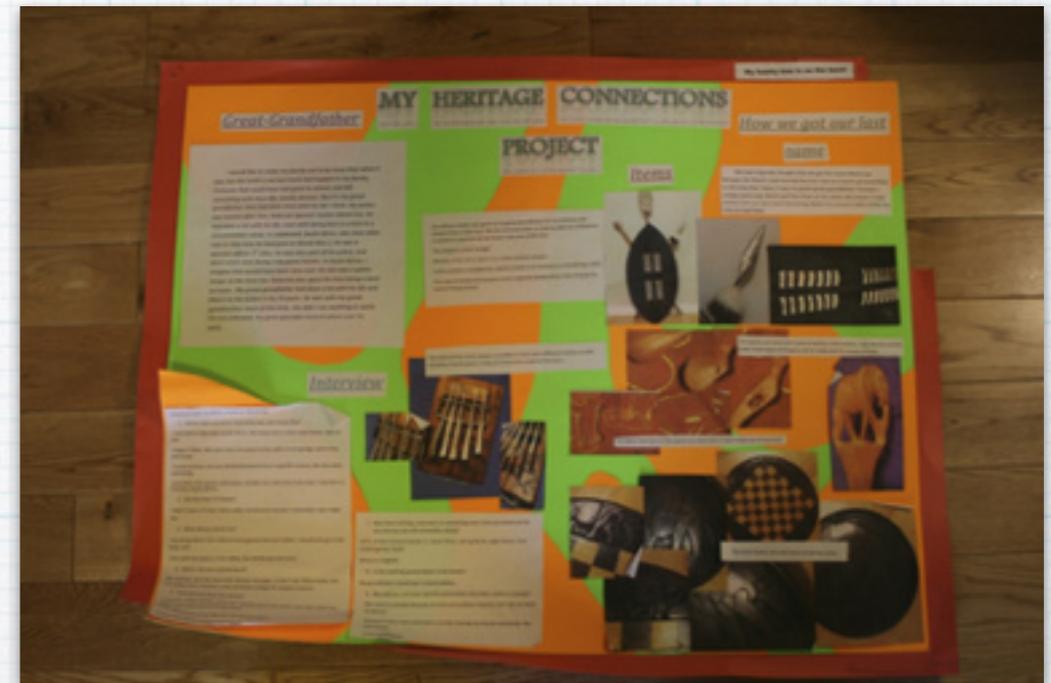
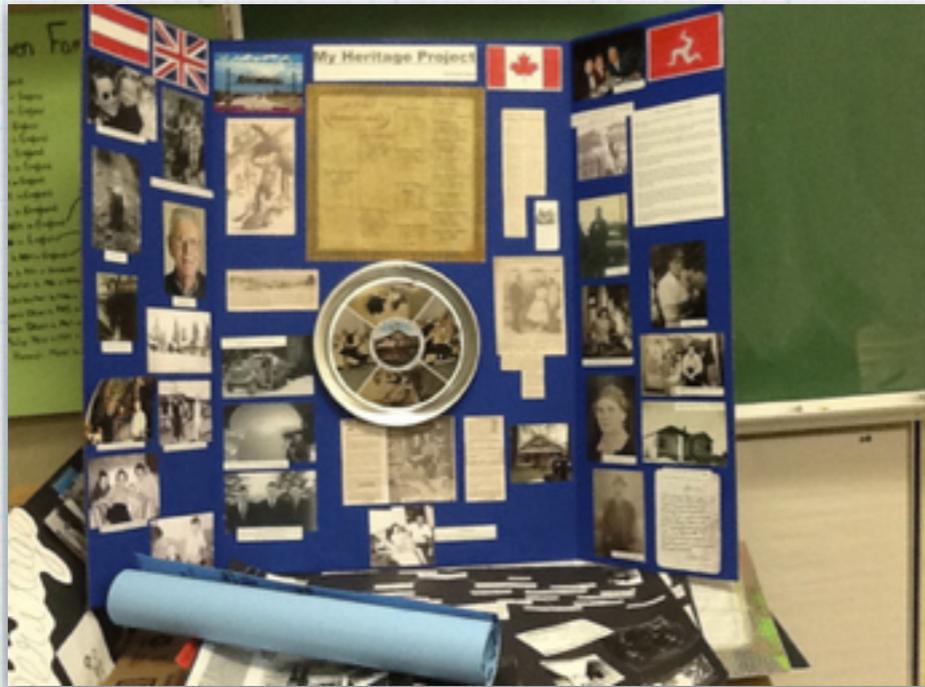


# CANYON WAR

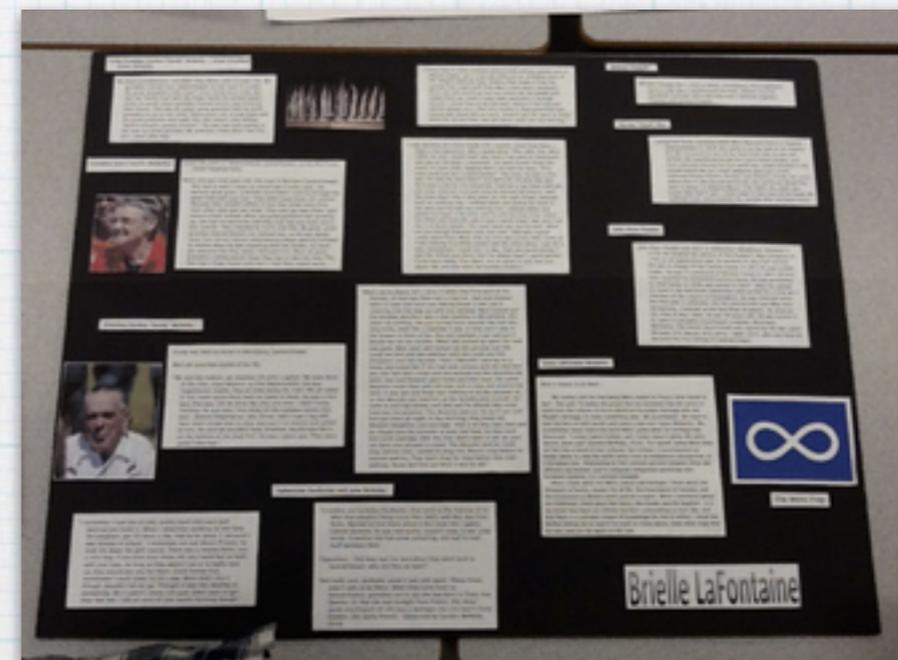
## THE UNTOLD STORY

DVD

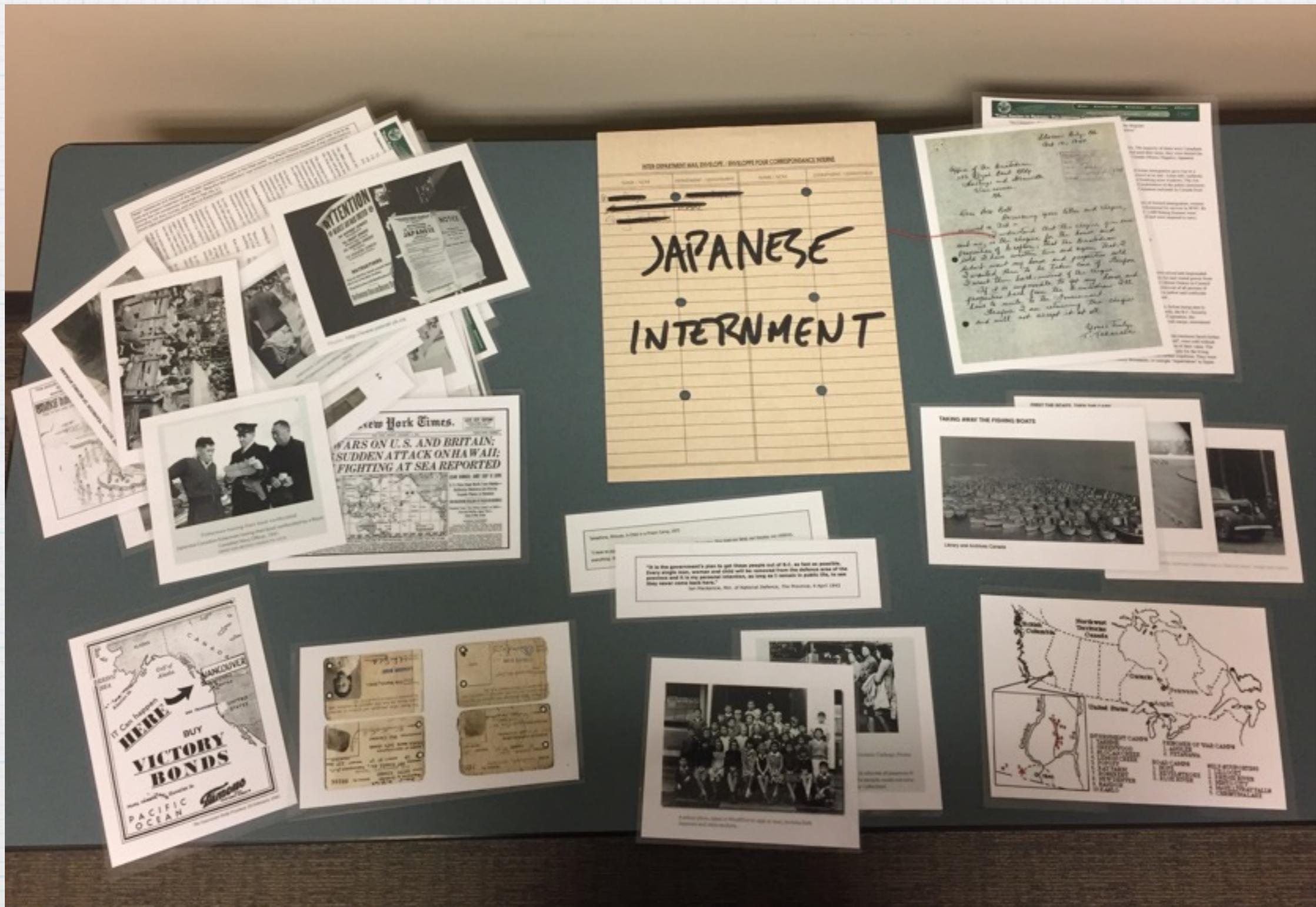
# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



## Heritage Inquiry



# SOME PROJECTS FROM THE PACIFIC SLOPE CONSORTIUM



# CURRICULUM DESIGN FOR CREATIVE AND CRITICAL THINKING

## Some questions to consider

- \* what kinds of design process do you use, and why did you choose it?
- \* how does your design process relate to your goals for how your classroom will be experienced by students, e.g. what are your intentions around student outcomes?
- \* are there discrepancies between your design goals and your values as an educator (e.g. does the assessment match your expressed purpose?)
- \* how can you use existing resources or activities to affect a new outcome (e.g. a focus on curricular competencies)?
- \* do you have a design team... what would you create with colleagues with a little time and money?

# CURRICULUM DESIGN FOR CREATIVE AND CRITICAL THINKING



## WORKSHOP RESOURCES and LINKS

<https://thielmann.ca/presentation-notes.html>

<http://thielmann.ca> • <http://pacificslope.ca>

