



**NSF DRK-12 Dissemination Session**

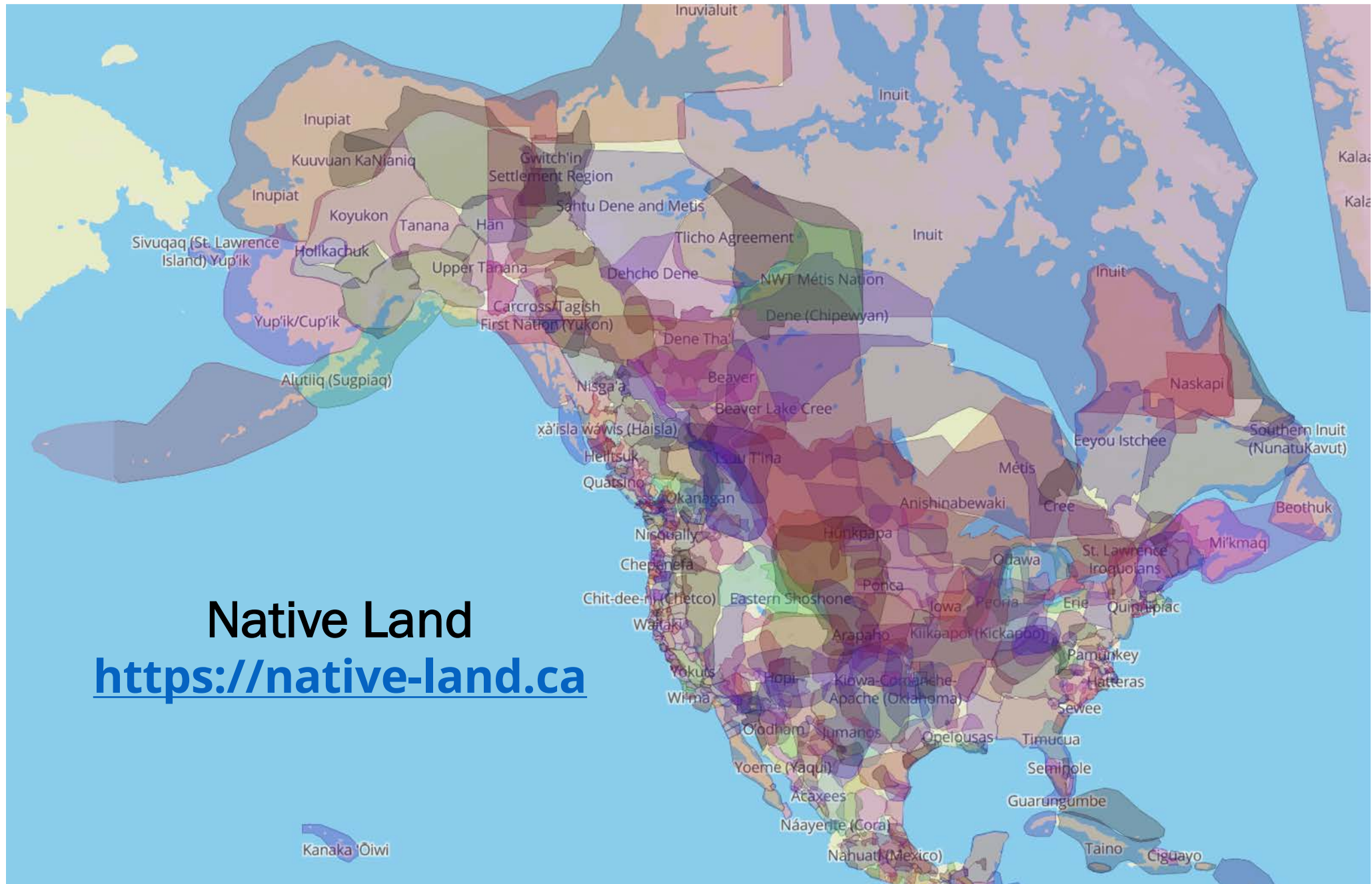
**Philip Bell & Jinfa Cai**

Over chat...

Briefly name some your key  
project dissemination strategies



# Tribal Land Acknowledgement



# **PERSISTENT PROBLEM**



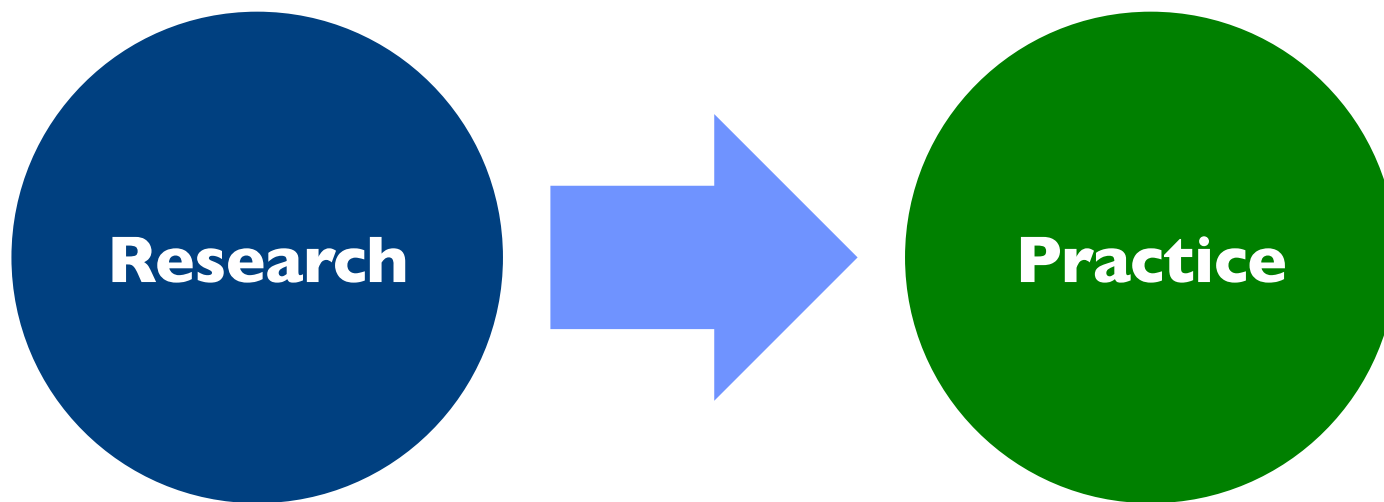
The diagram consists of three circles arranged in a triangle. The top-left circle is gray and labeled 'RESEARCH'. The top-right circle is green and labeled 'PRACTICE'. The bottom-center circle is dark blue and labeled 'COMMUNITY'. All three circles are of equal size and are connected by thin, light gray lines, forming a triangular network. The background is white.

**RESEARCH**

**PRACTICE**

**COMMUNITY**

# CLASSIC MODEL



**Knowledge Exchange (Translation)**

**Community is typically absent**

# Transformation is about relationships all the way down...



**Community Guided Approaches to Research *with* Practice**  
**Cultural Exchange, Collaboration & Infrastructuring (Solidarity)**  
Shift from **stakeholder frame** to **accountability-to-whom** frame

# Resources for Developing & Managing Research-Practice Partnerships



## RPP TOOLKIT

BUILD  
RELATIONSHIPS



DESIGN FOR  
EQUITY



GATHER AND USE  
EVIDENCE



COMMUNICATE  
WITH DIFFERENT  
AUDIENCES



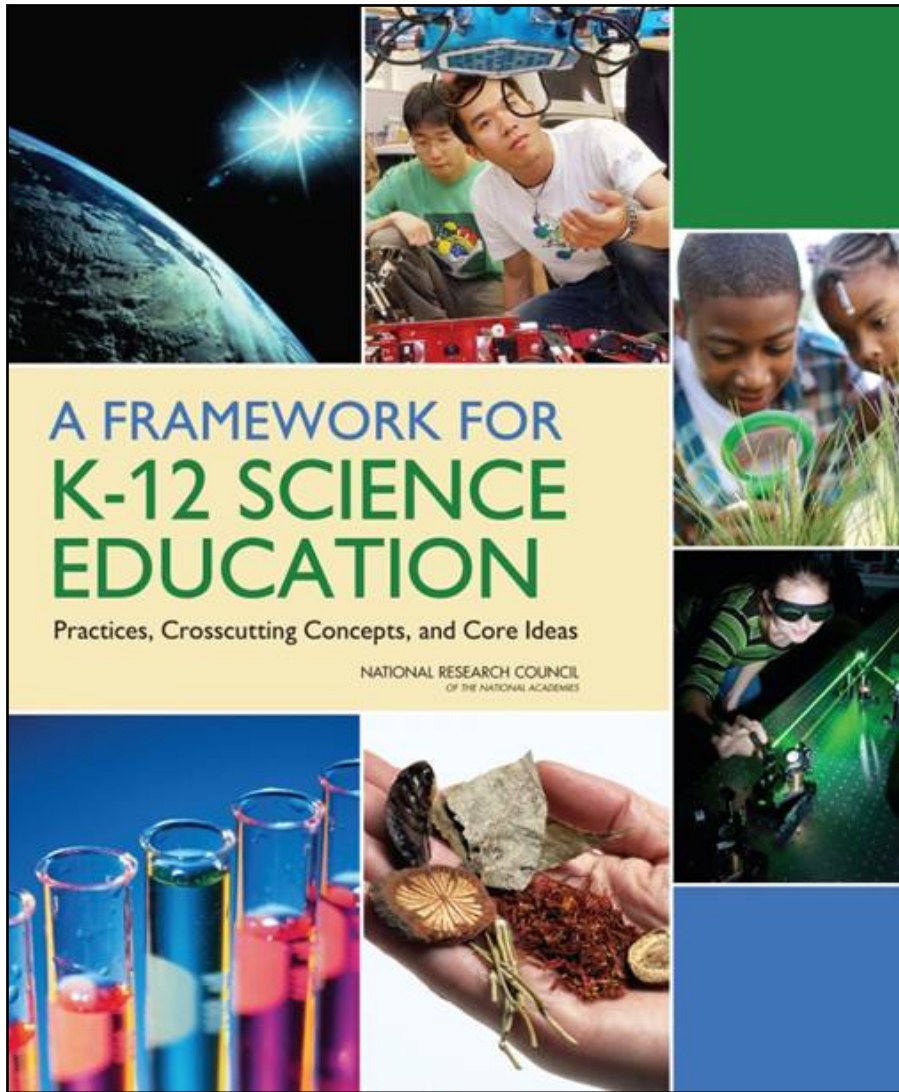
**<http://researchandpractice.org/toolkit>**  
**<http://learnDBIR.org/>**



# Overview of Dissemination Approaches by Dr. Jinfa Cai



# Infrastructuring Implementation of the Vision for K-12 Science Education



*The Framework & Standards were reviewed and refined by over 40,000 teachers, scientists, engineers, educational researchers, youth and other stakeholders in K-12 science ed.*

**Info Online: [tinyurl.com/ScienceFramework](http://tinyurl.com/ScienceFramework) & [nextgenscience.org](http://nextgenscience.org)**





What is the issue?  
K-12 science education should know about the importance of understanding the world around them.



Using technology to enhance learning



Through Design: from Expanding Engineering  
WHY IT MATTERS TO YOU  
Teachers should embed engineering practices in their science instruction and make it more relevant by focusing on community-centered design and problem-solving.



STEM #12  
Scientific literacy involves understanding global climate change & what people can do about it



What is the issue?  
Complexities of climate change and its disciplinary nature can make it a difficult task. However, this complexity of many of today's problems makes it an ideal for practice-based inquiry. Science in the classroom should focus on practices of modeling and designing solutions to climate change.

WHY IT MATTERS TO YOU  
Teachers should collaborate to analyze student work samples and video of their own teaching in ways that connect PD experiences with their classroom teaching.  
District staff & PD providers should provide sustained and responsive PD opportunities that focus on teachers' collaborative analysis of classroom instruction.  
School leaders should support practices that allow for teachers to engage in instructional practice



STEM #20  
Getting their hands dirty: Engaging learners in authentic science practices outside the classroom

What Is The Issue?

All learners benefit from outdoor science investigations. For young learners, research shows

WHY IT MATTERS  
Teachers should provide opportunities for students to explore the natural world



# Professional Learning Resources to Support NGSS / Framework Implementation



Overview: How can we promote equity in science education?

## What Is The Issue?

Equity should be prioritized as a central component in all educational improvement efforts. All students can and should learn complex science. However, achieving equity and social justice in science education is an ongoing challenge. Students from non-dominant communities often face “opportunity gaps” in their educational experience. [Inclusive approaches to science instruction](#) can reposition youth as meaningful participants in science learning and recognize their science-related assets and those of their communities.

## WHY IT MATTERS TO YOU

- Teachers should work with colleagues to implement instructional strategies to make science learning experiences more inclusive for all students.
- District staff and PD providers should integrate a focus on equity and social justice into every teacher learning experience in relevant ways—and not treat diversity as a segregated topic.
- School leaders should promote a sustained focus on inclusive science instruction. Efforts should be made to resource and monitor equitable opportunities to learn science.

BY PHILIP BELL AND MEGAN BANC, 1 JANUARY 2019

[STEMteachingtools.org/brief/15](https://stemteachingtools.org/brief/15)



Focusing Science and Engineering Learning on Justice-Centered Phenomena across PK-12

## What Is The Issue?

In [the Framework vision for science education](#), students engage in active investigations to make sense of natural phenomena and analyze and build solutions to problems. Basing these investigations on [justice-centered](#) phenomena can be a powerful and rightful way to support science and engineering learning. [Justice-centered investigations](#) can open up important opportunities for students to engage in projects that support equity for communities and to see how the application of science and engineering are fundamentally entwined with political and ethical questions, dimensions, and decisions.

## WHY IT MATTERS TO YOU

- Teachers should help students engage in projects that address intersecting systems of oppression (e.g., [racism](#), [heterosexism](#), [poverty](#), [settler colonialism](#), [ableism](#), [Islamophobia](#), etc.)
- District Staff & PD Providers should help educators develop phenomena-based justice units and learn to facilitate complex interdisciplinary conversations.
- School Leaders can help teachers connect with justice-centered organizations (e.g., to organize class visits, fieldwork, student presentations)—in addition to supporting justice within the school walls.

BY DEB MCCORMICK, PHILIP BELL & ABBY HARRIS, MAY 2020

[STEMteachingtools.org/brief/67](https://stemteachingtools.org/brief/67)

- Co-designed by practitioners & researchers
- Tested & refined over time
- Easily shareable—over social media, email, paper



Using science investigations to develop caring practices for social-ecological systems

## What Is The Issue?

How can we be more present for *other species* at a time of ecological devastation? Developing deep commitments to the human and [more-than-human inhabitants](#) of ecosystems is crucial for cultivating students’ [caring knowledge and practices](#) within the escalating challenges of the climate crisis. More-than-humans are typically represented in STEM curricula as objects of observation or utility rather than dynamic beings with rights to act and be recognized. All learners should build interdependent, caring relationships with more-than-humans focused on shared thriving to promote ecological identities, [deep STEM learning](#) about local places, and responsibilities.

## WHY IT MATTERS TO YOU

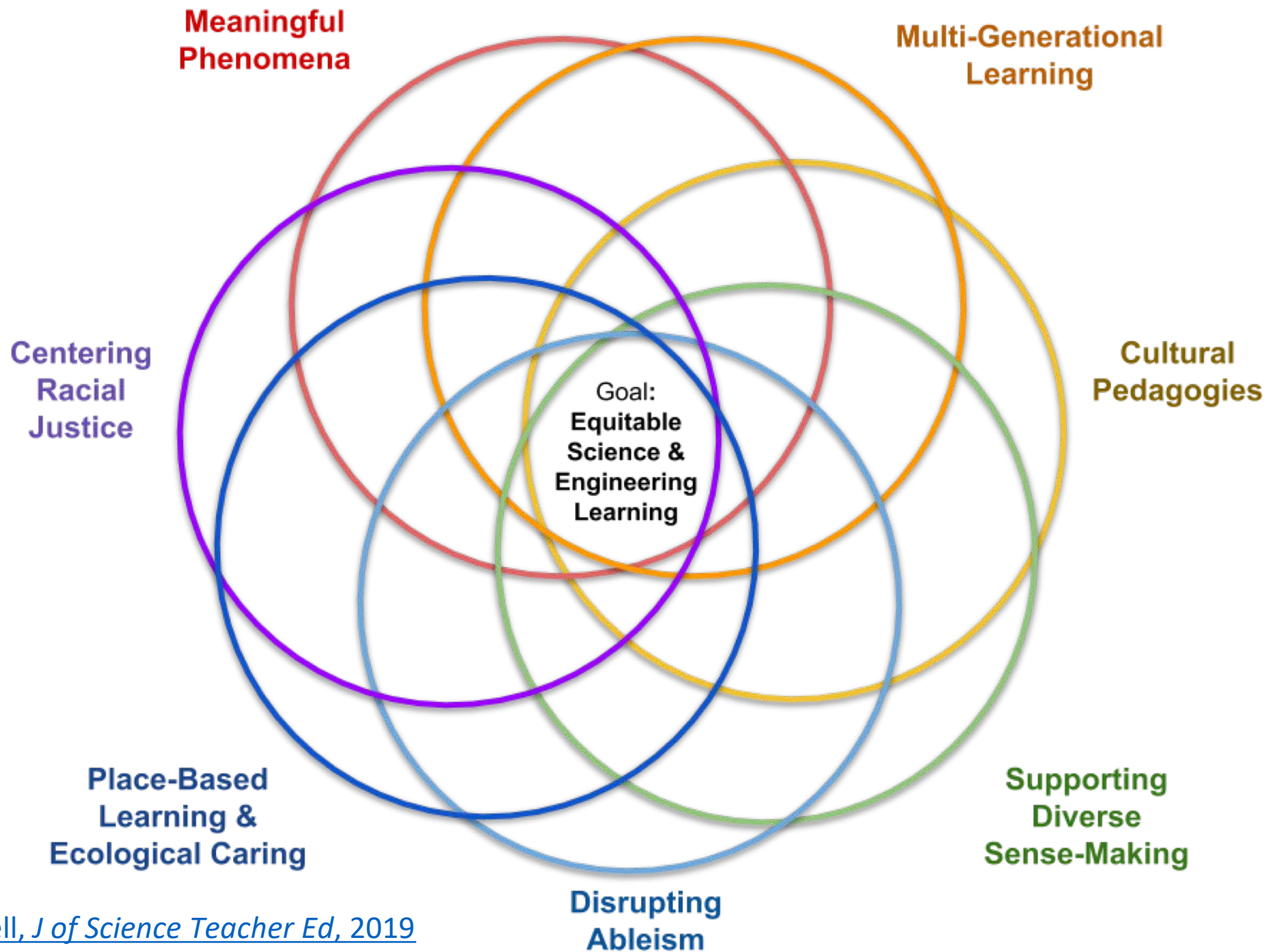
- Educators should create opportunities for learners to build relationships with various more-than-humans in local ecosystems and support inquiry processes that derive from learners’ concern and care for their relations.
- District Staff & PD Providers should help educators learn about local flora and fauna and engage through place-based education to support learners’ building of multispecies relationships.
- School Leaders should ensure that educators have sufficient time, space, and resources to engage learners in STEM field investigations.

BY RACHEL VAN AND PHILIP BELL, 1 JUNE 2019

[STEMteachingtools.org/brief/61](https://stemteachingtools.org/brief/61)



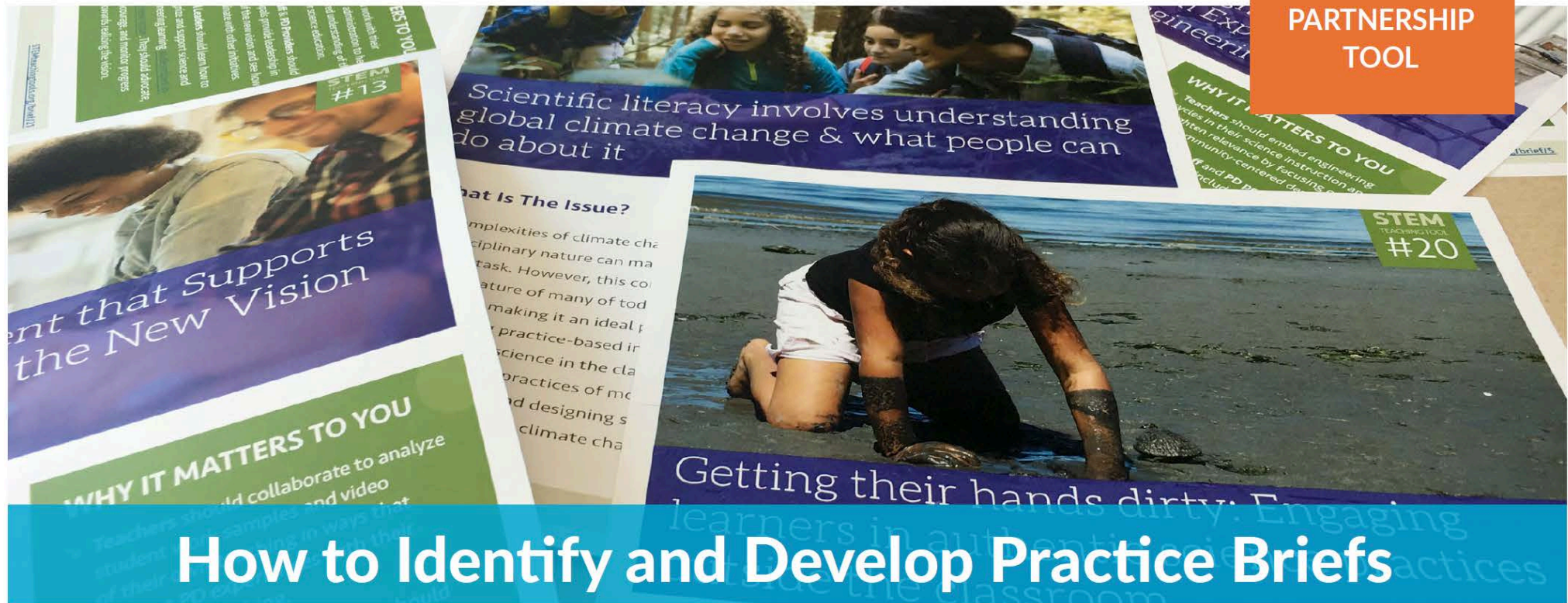
**STEMteachingtools.org**  
**@STEMteachtools (Twitter)**  
**facebook.com/STEMTeachingTools**



# Uses for STEM Teaching Tools

- In PD events: Vision overviews, topic-focused explorations, in direct support of project work
- By individual teachers refining their practice
- By PLCs, PLNs (e.g., on Twitter), science departments, projects engaged in implementation
- With principals, state STEM groups, assessment design teams, and informal science organizations
- In pre-service science methods courses & graduate seminars
- By organizations messaging about Framework / NGSS through newsletters, sites, email...
- To communicate with parents about science ed





# How to Identify and Develop Practice Briefs

## About This Tool

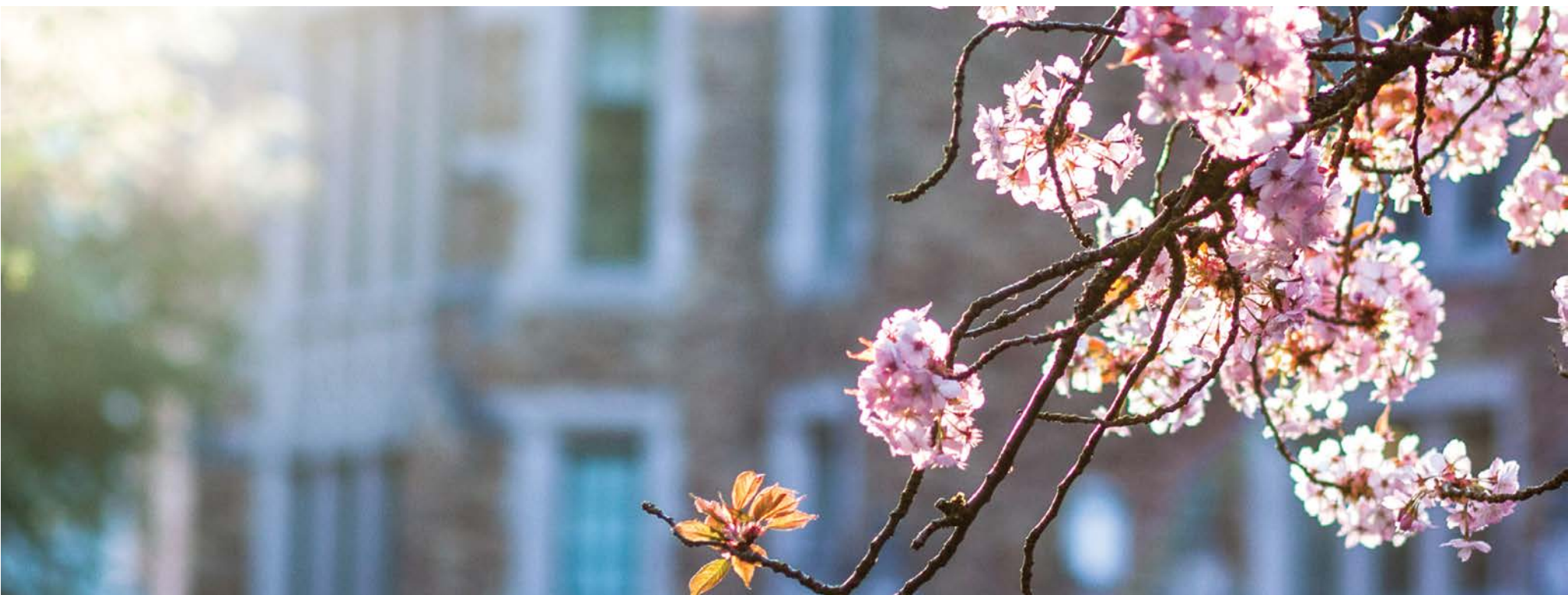
**Purpose:** To provide a “how to” document for identifying and authoring practice briefs that can be used to support practitioners and researchers in their educational improvement activities.

**Audience:** Members of a partnership responsible for authoring and/or editing resource collections related to the work.

**When to Use:** When a partnership is developing insights and approaches that are ready to be more broadly shared with educational practitioners.

<http://tinyurl.com/PracticeBrief>





# Thoughts on using social media to improve education as a researcher

Philip Bell, Learning Sciences & Human Development



UNIVERSITY *of* WASHINGTON | COLLEGE OF EDUCATION



# Share Quality Resources Routinely



A4) Here are some specific ways to overlap instruction with the cultural lives of students & their communities...  
#NGSSchat

[stemteachingtools.org/brief/31](https://stemteachingtools.org/brief/31)  
[stemteachingtools.org/brief/58](https://stemteachingtools.org/brief/58)  
[stemteachingtools.org/pd/session](https://stemteachingtools.org/pd/session)  
[stemteachingtools.org/tgs/Culture](https://stemteachingtools.org/tgs/Culture)



6:39 PM · Mar 4, 2021 · Twitter Web App



PLS RT/SHARE/ADAPT #NGSSchat & #SciEd!

SUPPORTING STUDENTS' SCIENCE LEARNING DURING COVID-19 SCHOOL CLOSURES - NEW LANGUAGES

These resources from @CSSSupervisors are now available in English, Korean, Chuukese, Spanish & Arabic (w/ others in process).

[stemteachingtools.org/news/2020/guid...](https://stemteachingtools.org/news/2020/guid...)



supervisors

Mar 26, 2020 · Twitter Web App



PLS RT #NGSSchat—Here are links to all slides & resources from my #NSTA19 sessions  
Assessment [twitter.com/philipbell/st...](https://twitter.com/philipbell/st...)  
Teacher Resources [twitter.com/philipbell/st...](https://twitter.com/philipbell/st...)  
Equity&Justice [twitter.com/philipbell/st...](https://twitter.com/philipbell/st...)  
Family STEAM [twitter.com/philipbell/st...](https://twitter.com/philipbell/st...)  
Diverse Sense-Making



You and 3 others



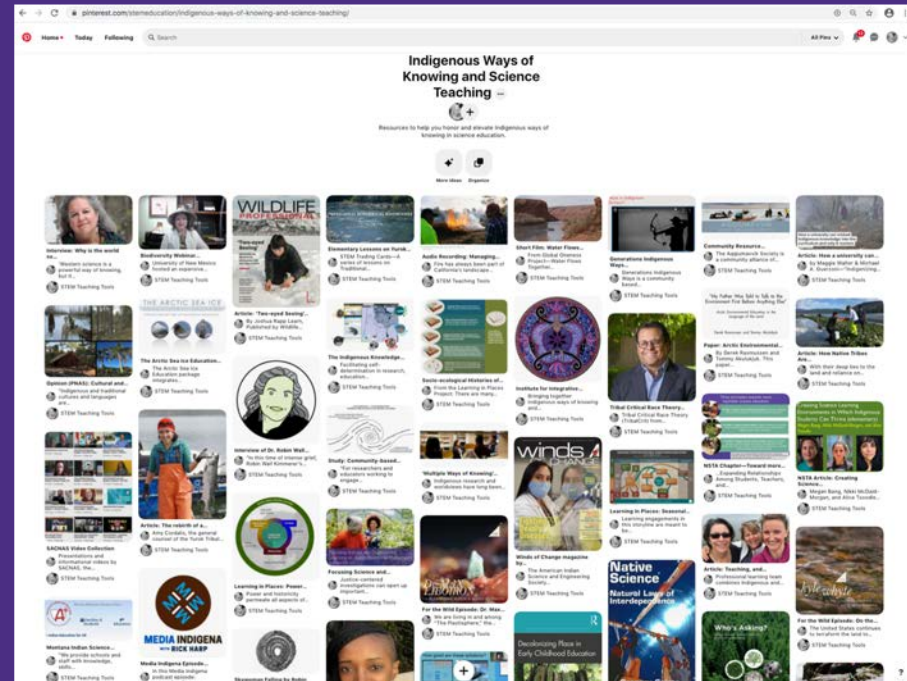
Replying to @sbottasullivan @AmbScienceTeach and 4 others

♥ In addition to cultural/funds of K work, it is useful to trace current #SciEd instruction back to ANCHORED INSTRUCTION & COGNITIVE APPRENTICESHIP—anchoring phenom, learner agency, making thinking visible, scaffolding talk & tasks  
[instructionaldesign.org/theories/anchored-instruction/](https://instructionaldesign.org/theories/anchored-instruction/)



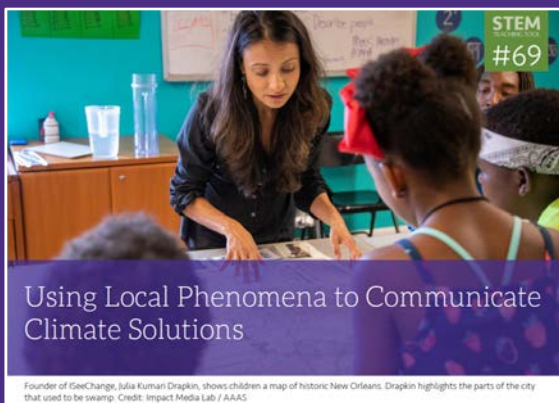
Cognitive Apprenticeship - InstructionalDesign.org  
Cognitive apprenticeship is a theory of the process where a master of a skill teaches that skill to an apprentice. ...  
[instructionaldesign.org](https://instructionaldesign.org)

12:56 PM · Feb 20, 2021 · Twitter Web App





# Tap into communication channels of other orgs by building relationships



# Think in Public



Philip Bell — 6+ft—  
@philipbell

## SUNDAY REFLECTION...

How many years will it be before [#SciEd](#) talks about promoting TRANSGRESSION in learning contexts as easily & deeply as we currently talk about promoting STUDENT PARTICIPATION in our learning communities? 5 years? 20? [#LaborForFreedom](#)

Lenora M. Crabtree PhD @LenoraMCrabtree · Mar 6

Reading when I should be 📖 (as usual) but as we begin a 2nd year in this new environment bell hooks reminds me that the [virtual] classroom, w/ all its limitations, remains a location of possibility & that education, at its core, is the practice of freedom. [#teachingtotransgress](#)

The academy is not paradise. But learn paradise can be created. The classroom, w/ all its limitations, remains a location of possibility. In that field we have the opportunity to labor for freedom ourselves and our comrades, an openness of mind allows us to face reality even as we collectively move beyond boundaries, to transgress. This is the practice of freedom.

8:45 AM · Mar 7, 2021 · Twitter Web App

# Learn Together

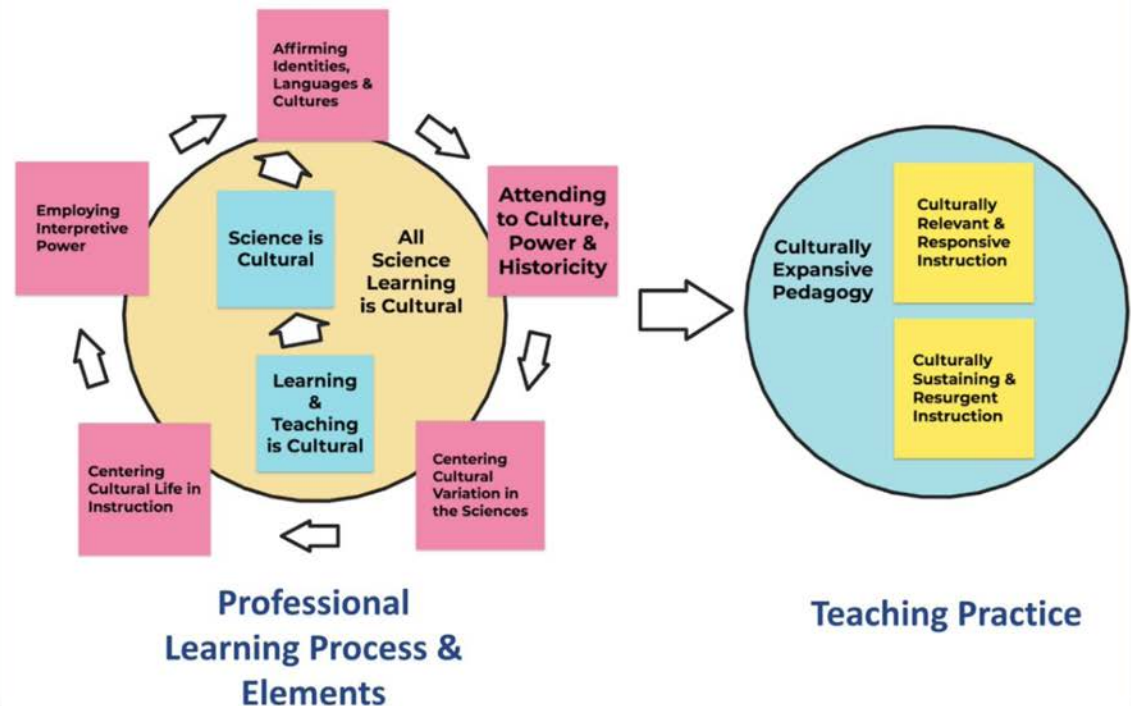


Philip Bell — 6+ft—  
@philipbell

Replying to [@drloriandersen](#) and [@STEMTeachTools](#)

In our [@AcesseProject](#), we are building out [#OER](#) professional learning pathways that help people understand the overlaps & distinctions between those forms of cultural pedagogy in [#SciEd](#). Would love your input / feedback as we get further into it. This is the draft framework...

## Cultural Pedagogies Learning Framework



12:32 PM · Nov 21, 2020 · Twitter Web App



# Engage in public pedagogy



Philip Bell 🌞 — 6+ft — @philipbell · Feb 6

We explored resources leveraging concepts of:

- ✿ thick present
- ✿ entanglement & shimmer
- ✿ nonhuman sentience
- ✿ ethics of principled exclusion
- ✿ designing for radical interdependence & community-led justice

Links are in #UWClimateEd slides for Session 5:  
[sites.google.com/uw.edu/climate...](https://sites.google.com/uw.edu/climate...)

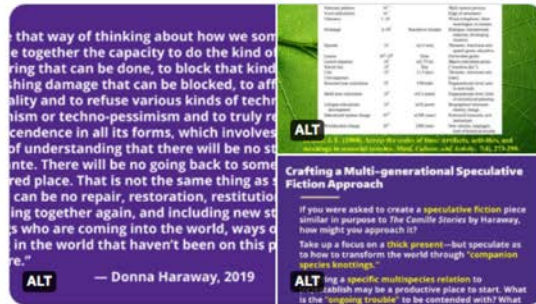


2 3 3



Philip Bell 🌞 — 6+ft — @philipbell · Feb 6

We need to design for emergence of partial recuperation across multiple timescales. Building on Haraway's model of the CAMILLE STORIES, the group explored how to frame SPECULATIVE, multi-generational stories of PARTIAL FLOURISHING through COMPANION-SPECIES KNOTTINGS.  
 #UWClimateEd



1 1 2



Philip Bell 🌞 — 6+ft — @philipbell · Feb 6

In Session 6 of #UWClimateEd, we will keep exploring speculative ethics in ECOLOGICAL THINKING & CARING from critical, Black feminist perspectives & wrap up discussing BRAIDING SWEETGRASS.

Links to these readings & media are on the #UWClimateEd web site:  
[sites.google.com/uw.edu/climate...](https://sites.google.com/uw.edu/climate...)

- **Book:** *Braiding Sweetgrass*, Burning Sweetgrass section & Epilogue (pp. 303-384)
  - Please also read and reflect on [this Twitter thread](#) by Dr. Zoe Todd
- **Article:** "Nothing comes without its world": thinking with care by María Puig de la Bellacasa
- **Short Article:** *Black Feminist Ecological Thought: A Manifesto* by Dr. Chelsea Mikael Frazier
- **Podcast Episode:** Listen: How Beyoncé, Issa Rae, and other Black women lead on the environment (by Grist staff)



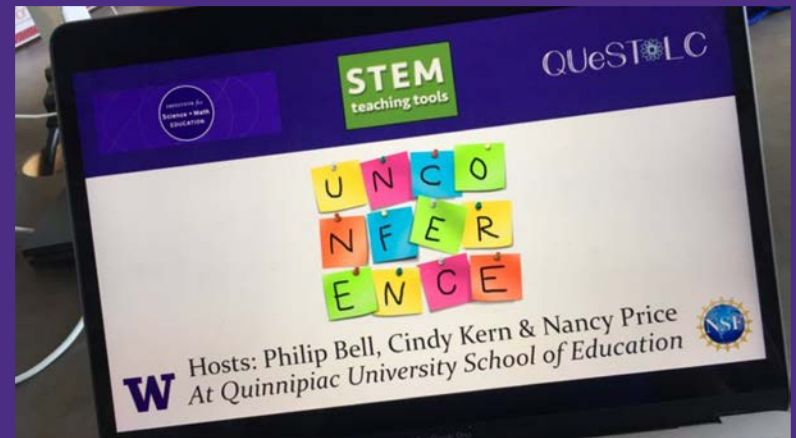
Climate & Environmental Justice in Education

Home About Readings Resources Journal



Winter 2021 Graduate Seminar

How should we promote learning in order to create more just, thriving, and regenerative conditions for all Earthly beings, human and otherwise?



Cindy Kern 🌞 @CindyLKern

August 16, 2019

**@STEMTeachingTools Unconference @Questa-LC**

Dr. Phil Bell, a professor of the Learning Sciences & Human Development at the University of Washington, facilitated a participant-driven 4-day workshop around the STEM Teaching Tools at the Quinnipiac University's Science Teaching & Learning Center.

Photo via @philipbell

Over chat...

What questions do you have  
about project dissemination?



Break out rooms: Explore your  
dissemination questions &  
post an insight to our  
Jamboard

