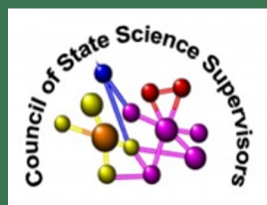
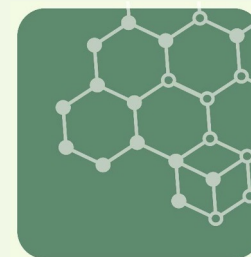


ACESSE: Collaborative Network for Improvement in Science Education



This work is funded by the National Science Foundation under grant #1920249. However, all opinions are strictly our own. The project is a collaboration with the Council of State Science Supervisors, the University of Washington, and the University of Colorado at Boulder.



ACESSE stands for....

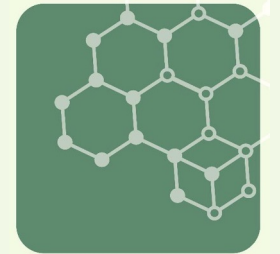
**Advancing Coherence and Equity in
Systems of Science Education**



**What makes for an equitable, coherent
state system of science education?**

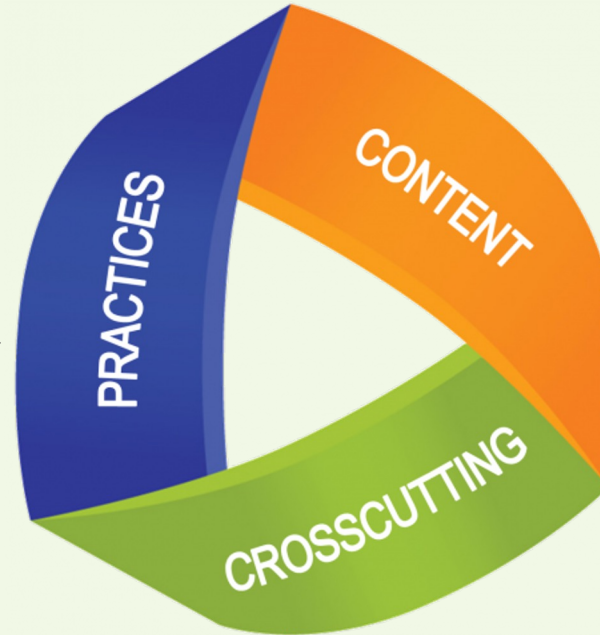
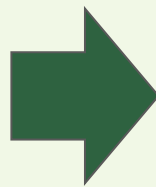
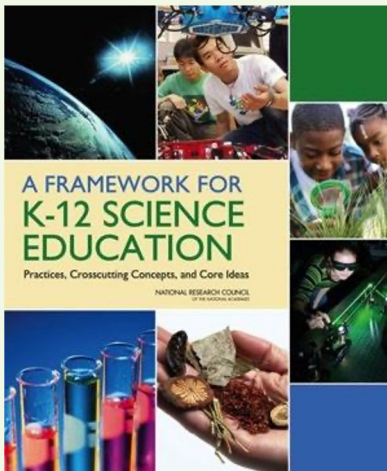
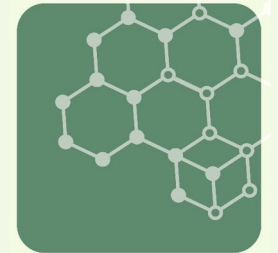
<https://sites.google.com/view/acesseproject/>

Research Questions



- 1. How is instructional guidance to teachers from states and districts changing over time?**
- 2. How can we support the development of a shared understanding of equity and a commitment to a coherent set of equity projects across states?**
- 3. How are leaders' strategic use of resources changing over time?**

Supporting a 5 Dimensional Vision of Science Education



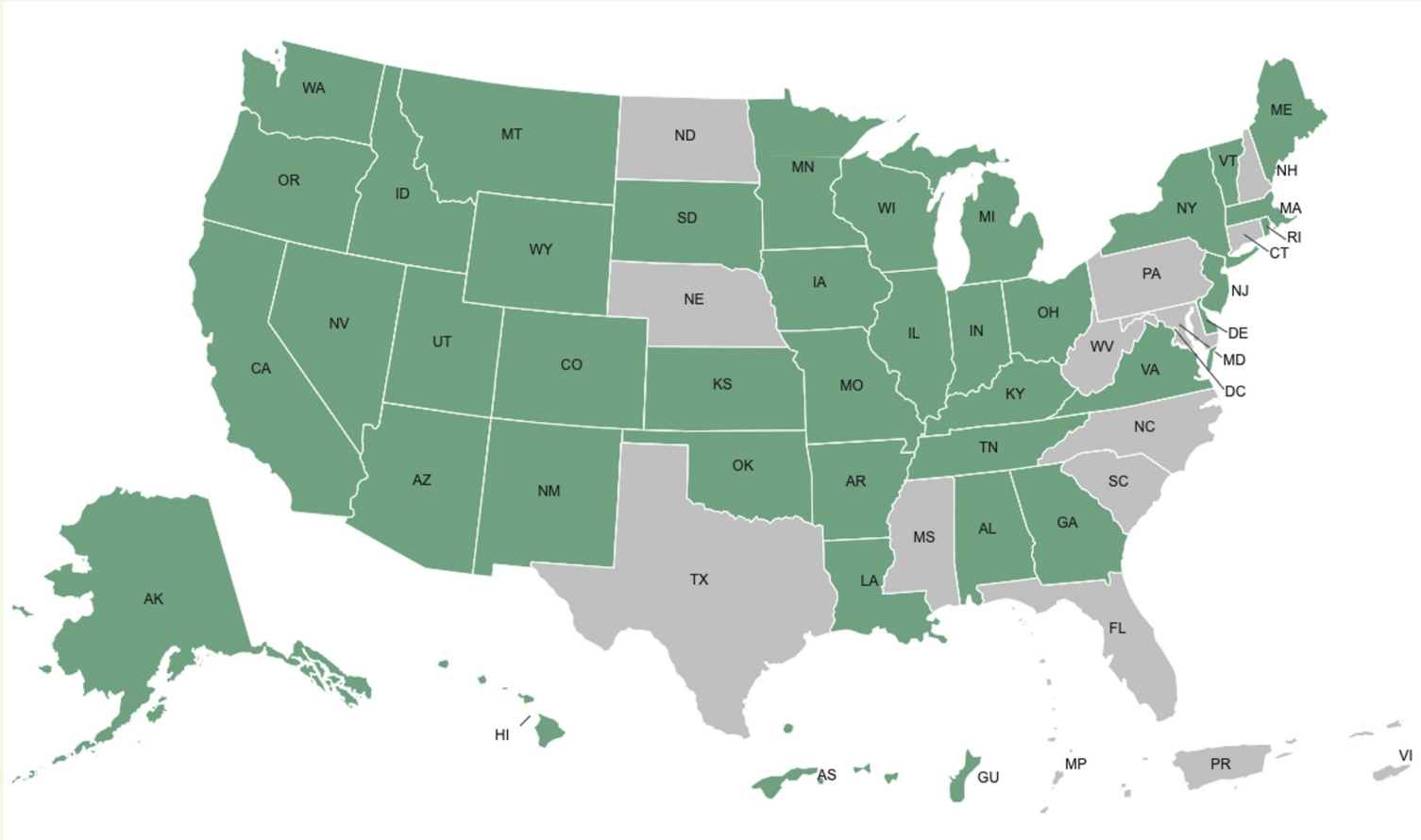
INTEREST

IDENTITY

The ACESSE Collaborative



ACESSE Network



Organizing for Equity and Coherence

PROMOTE EQUITY

Expand learning
access & disrupt
inequities

Center justice in
instructional
practices

CRAFT COHERENCE

Build a shared
vision for science
teaching

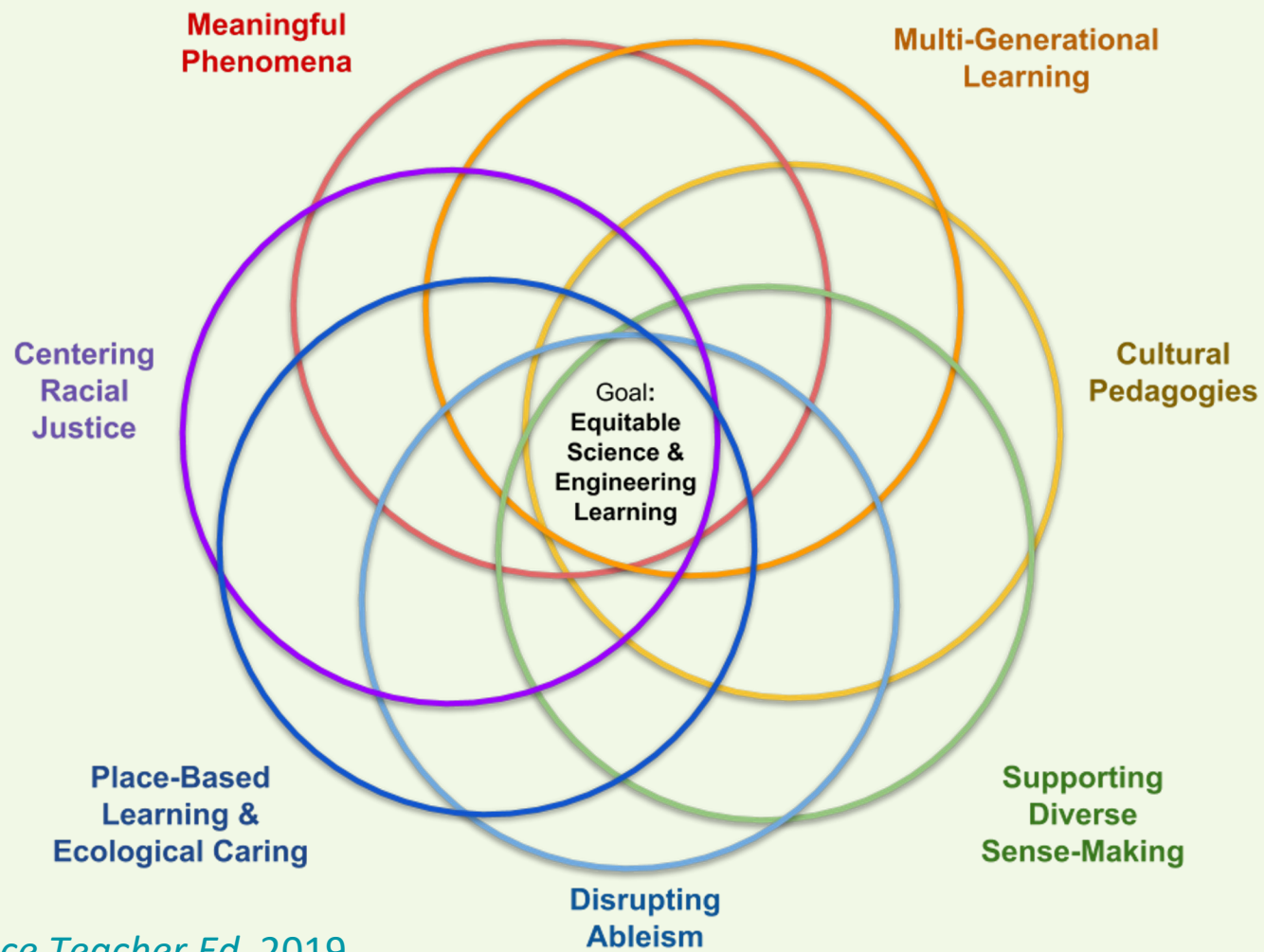
Bring key
components into
alignment

ORGANIZE TOGETHER

Build a distributed
team to lead

Network to share
strategies & tools
for change

Leadership capacity development for equity



[Bell, J of Science Teacher Ed, 2019](#)

The Work of ACESSE

Sensing & Guiding Improvement 



Goal:
**Equitable
Science &
Engineering
Learning**

3 Lines of Work

Leadership Capacity
Development for
Equity 

 Co-Design of
Professional
Learning Resources



Affinity Work Groups (within the network)

Local State Teams

Collaborative
Groupings

Levers for Promoting Coherence and Equity

1) Classroom Formative Assessment

Cognitive & cultural, relevant 3D tasks, facet analysis, self-documentation, diverse sense-making.

2) Instructional Materials Adaptation

Support principled adaptation to attend to local features.

3) Leadership Capacity

Development for Equity
Professional learning for strategic leadership.



Sensing & Guiding Improvement

Designed to help local teams understand local systems and set improvement goals



State Leader Survey

Priorities for change
Perceptions of policies
and processes to support
equitable science teaching
Awareness and
involvement in equity
projects

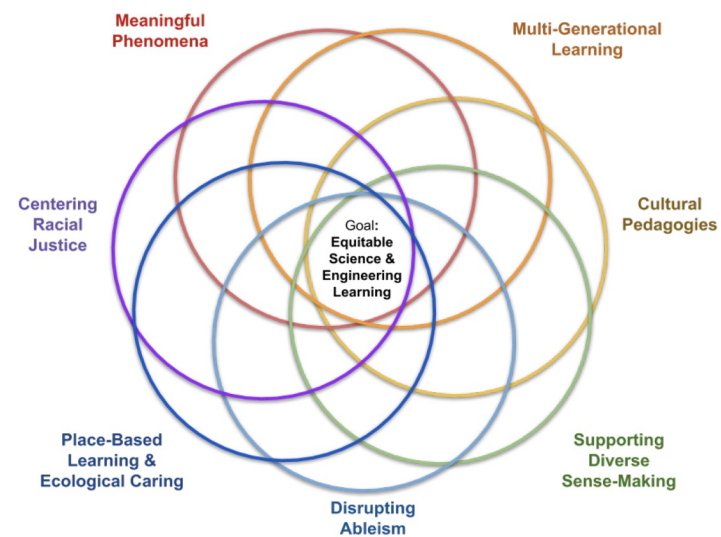


State Stakeholder Survey

Priorities for change
Perceptions of policies and
processes to support
equitable science teaching
Awareness and involvement
in equity projects
Noticing for Equity

ACESSE resource development is guided by an intersecting equity project framework.

Collaborative design work helps refine such resources.



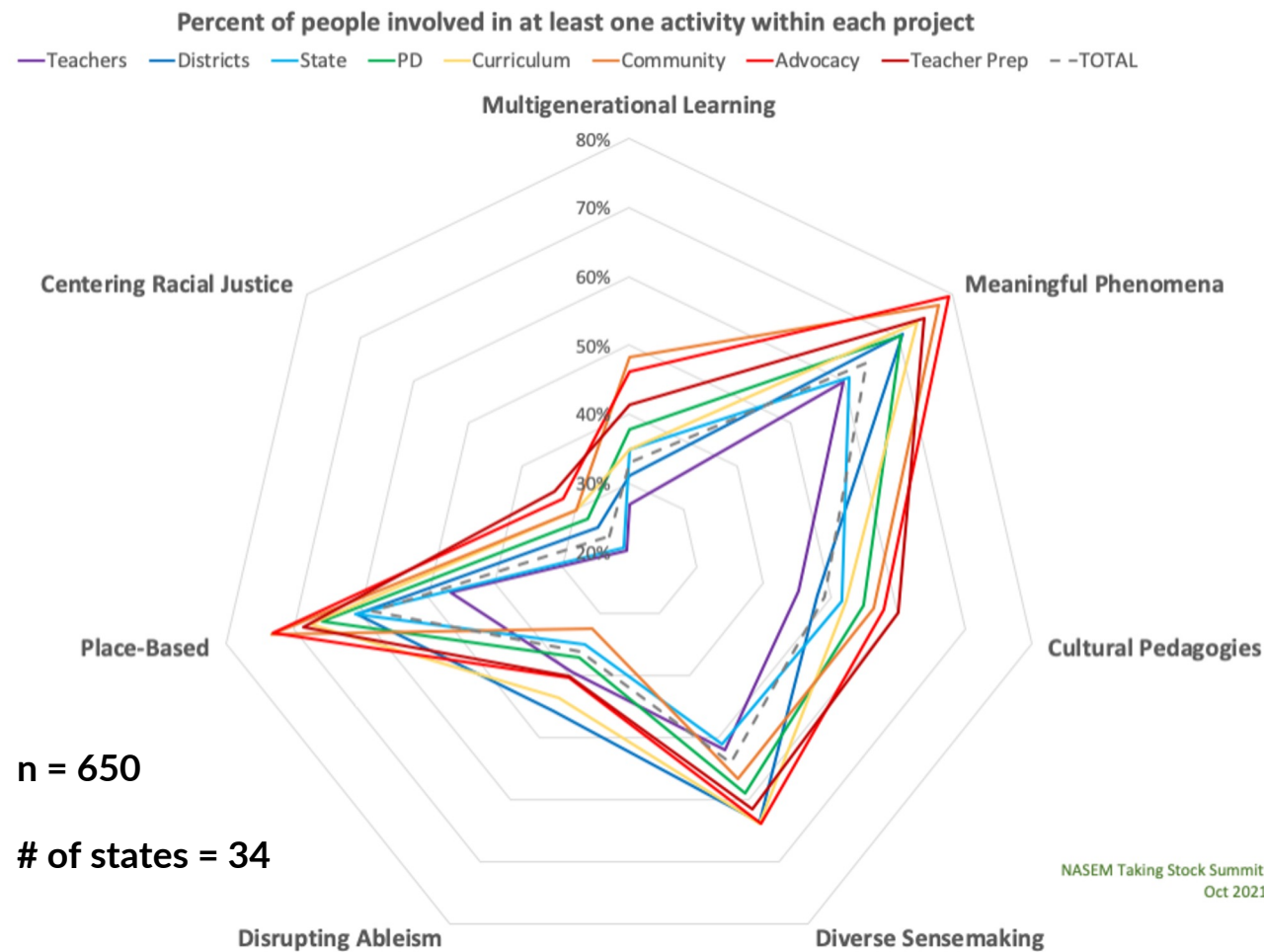
This brief outlines ways science teachers can engage in seven intersecting equity projects (Bell, 2019).

STEM
TEACHING TOOL
#71

How can you advance equity and justice through science teaching?

<http://STEMteachingtools.org/brief/71>

Sensing & Guiding Improvement: Variable Equity Participation by Role

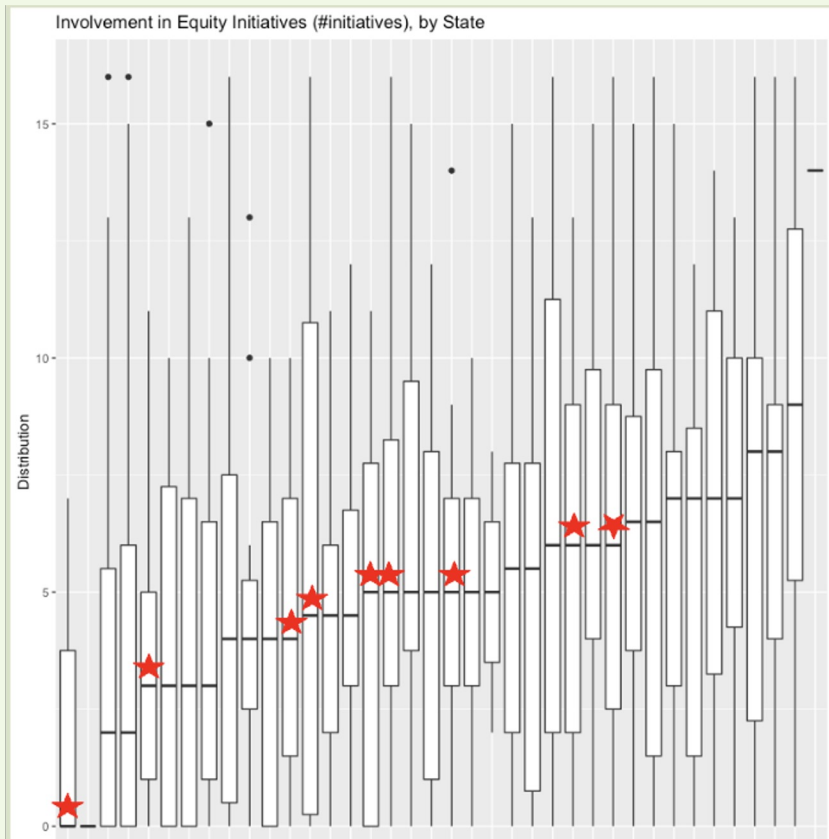


Research Question:

How did participation in equity projects vary by professional role in science education?

Findings: Racial justice work was least engaged in. Teacher Educators, Community, and Advocates have the most expansive participation—although still variable. Teachers had most restricted participation.

Sensing & Guiding Improvement: Involvement in Equity Projects by State



Research Question:

Did leaders in states with new “gag laws” participate more or less in equity efforts than leaders in other states? (red star = “gag order” state)

Finding: We found that involvement in equity initiatives was significantly lower in states with gag laws in place, as compared to other states. This was true for equity initiatives overall and for racial equity initiatives, in particular. (n=297, states=32)

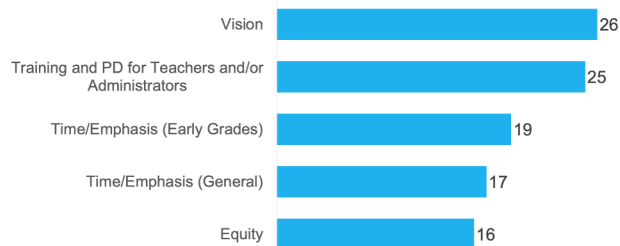
Sensing & Guiding Improvement



Changes, supporting & hindering conditions for equity in states (from survey of state science leaders, n=45)

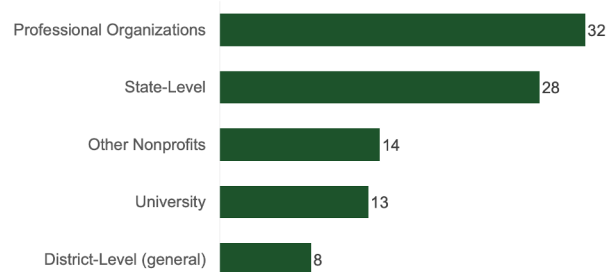
Top changes respondents would make in their state to support science learning

(n=45, each of whom could name three changes, each of which could get multiple codes)



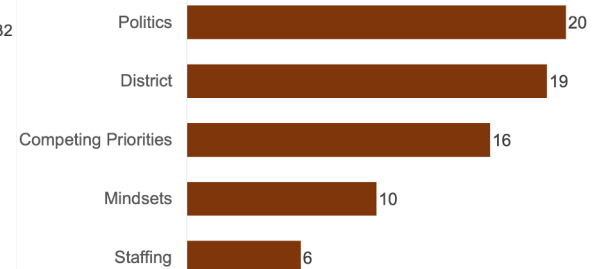
Top Factors Named as Supporting Equitable 3D Implementation

(n=45, each of whom could name as many supports as they wanted)



Top Factors Named as Inhibiting Equitable 3D Implementation

(n=45, each of whom could name as many supports as they wanted)



Leadership Capacity Development for Equity



Participate in a network focused on improving state and local policies aimed at increasing coherence and equity based on the vision of the Framework for K-12 Science Education

- Collaborate with and learn from other state science supervisors and researchers
- Develop or enhance state and territory networks in order to implement the vision of the Framework
- Significant network turn-over during pandemic
- Network navigating strong political polarization around education equity

Leadership Capacity Development for Equity



Frame Amplification: Heighten the moral salience of addressing the problem (either as you define it or as originally defined).

What might you say to district leaders?

Add an idea

Moral imperative to do what is right for students and their futures, and not what is most expedient for adults

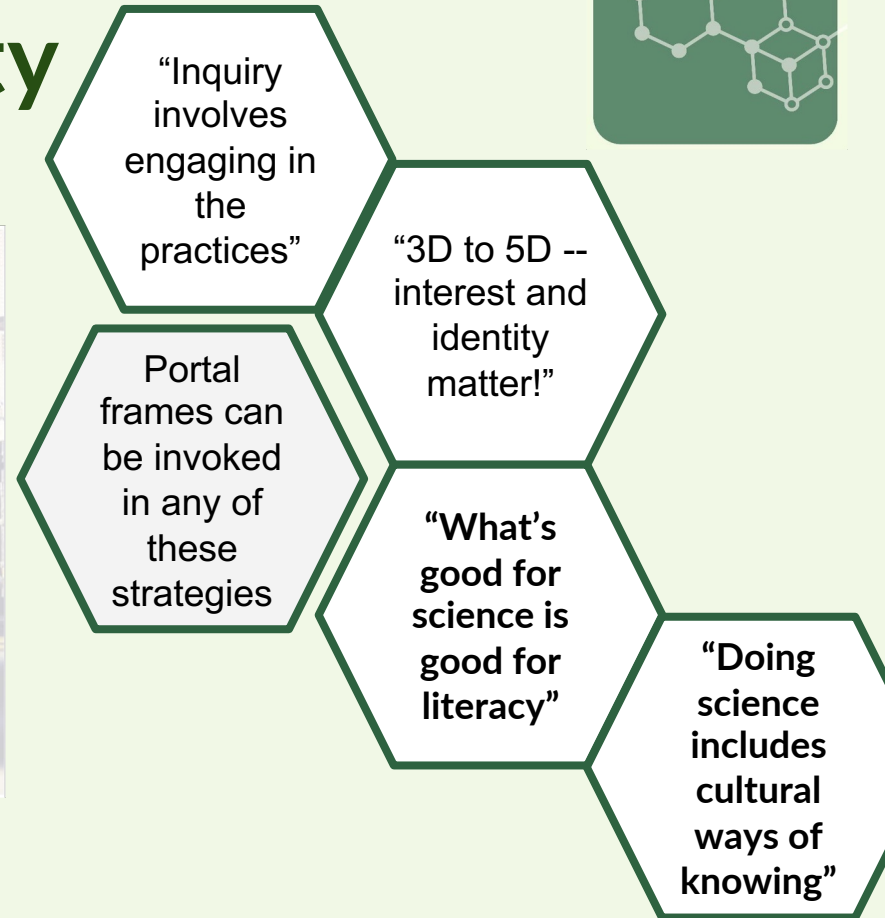
The educational standards define how the educational system is defining educational achievement in terms of scientific literacy. We think you should join in this important equity purpose!

WHOSE INTEREST ARE BEING SERVED?

I'm wondering where your commitment to not supporting the shared educational standards for scientific literacy is coming from. Is it from your history? Your field? A funder? Whose interests are being served by holding that commitment?

Ensuring students are prepared for college and career with the building blocks of science presented in high school science standards is critical. Without those concepts students will be at a disadvantage for success.

Will this prepare our students for life/success after graduation? We don't want to close doors for any child. We want them to be prepared to go to college, military, work etc. and be able to choose that path even after graduation.



ACESSE Collaborative Design Process



Identify

- Center on justice
- Interview / Survey
- Deliberate

Ideate

- Brainstorm
- Theorize
- Specify / mock up
- Design

Develop

- Create
- Use / test
- Review
- Iterate

Publish

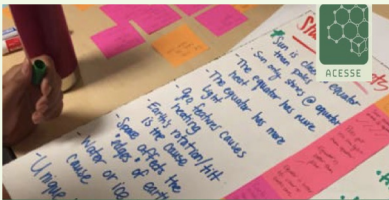
- Polish & Post
- Support Adaptation & Use

Revise

- Analyze
- Reflect
- Improve

← Engage in equity & justice learning and social dreaming throughout →

Co-Design of Professional Learning Resources



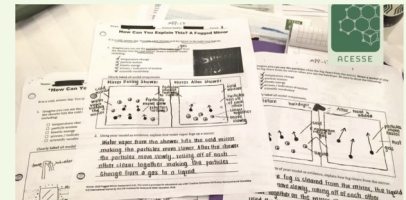
ACESSE Resource A: Introduction to Formative Assessment to Support Equitable 3D Instruction



ACESSE Resource B: How to Assess Three-Dimensional Learning in the Classroom



ACESSE Resource C: Making Science Instruction Compelling for All Students: Using Cultural Formative Assessment to Build on Learner Interest and Experience



ACESSE Resource D: How to Craft 3D Classroom Science Assessments



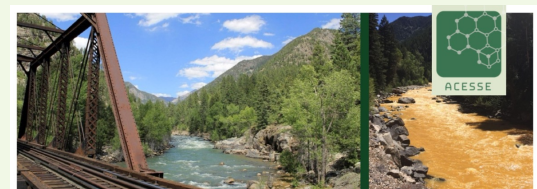
ACESSE Resource E: Selecting Anchoring Phenomena for Equitable 3D Teaching



ACESSE Resource F: Guiding Instruction Based on the Range of Student Thinking Through Cognitive Formative Assessment



ACESSE Resource G: Learning to See the Resources Students Bring to Sense-Making



ACESSE Resource H: Attending to Student Interests and Community Priorities in Phenomena



STEM #62
What does subject matter integration look like in elementary instruction? Including science is key!



STEM #87
Identifying local environmental justice phenomena for science and engineering investigations



STEM #57
How place-based science education strategies can support equity for students, teachers, and communities



STEM #43
Why Do We Need to Teach Science in Elementary School?

Resources have been accessed, adapted & used very broadly.

Professional Learning Resources to Support NGSS / Framework Implementation

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



STEM #15

Overview: How can we promote equity in science education?

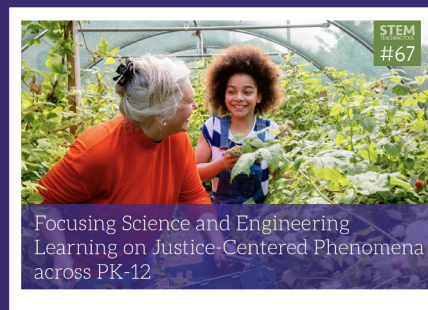
What Is The Issue?

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 recognize and promote equitable opportunities to learn science.

BY THEPHELL ANDVICKARJAC | JANUARY 2016 | STEMteachingtools.org/issue/15



STEM #67

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

What Is The Issue?

In the Framework's 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, sexism, homophobia, transphobia, 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-oriented organizations (e.g., to organize class visits, fieldwork, student presentations)—in addition to supporting justice within the school walls.

BY DEBORACHA, THEPHELL & VICKARJAC | MAY 2016 | STEMteachingtools.org/issue/67



STEM #61

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, despite STEM learning about local places, and responsibilities.

WHY IT MATTERS TO YOU

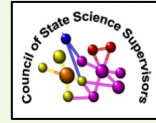
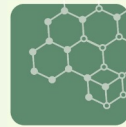
- Educators should create opportunities for learners to build relationships with various **more-than-humans** in local ecosystems and support inquiry processes that derive from learners' concern and care for their relations.
- District Staff & PD Providers should help educators learn about local flora 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 MICHELLE AND THEPHELL | JUNE 2017 | STEMteachingtools.org/issue/61



STEMteachingtools.org
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facebook.com/STEMTeachingTools

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<https://sites.google.com/view/acesseproject/home>