The National Academies of SCIENCES ENGINEERING MEDICINE

BOARD ON SCIENCE EDUCATION

Taking Stock of Science Standards Implementation: A Summit

Day 3

Sponsor: Bill & Melinda Gates Foundation

Reminder: Policy on Preventing Discrimination, Harassment, and Bullying

- Maintain a work environment free of harassment and intimidation
- Shared responsibility not to commit harassing or discriminatory acts, not to tolerate or ignore those of others, and to avoid knowingly placing others in situations where they may be harassed
- Compliance required in all settings at the National Academies in which work is performed
- Report any incident of harassment, discrimination, or bullying to NASEM staff

Norms for Participation

- Embrace diversity
  - Differences in opinion are welcomed
  - Be open, listen and respectfully
- Strive to promote an inclusive environment where everyone feels welcomed, valued, respected, and supported
  - Be constructive in your comments
  - Bullying behavior will not be tolerated

Committee Members

Aneesha Badrinarayan
Learning Policy Institute

James Blake
Lincoln Public Schools

Ravit Duncan
Rutgers University

Maya M. Garcia - Chair
Colorado Department of Education

Jessica Henderson-Rockette
Instruction Partners

Victor Sampson
University of Texas, Austin

Sam Shaw
Ed Reports

Tricia Shelton
NSTA

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Objectives

- Understand the current state of science standards implementation.
- Determine what criteria and indicators are guiding schools, districts, and states in their implementation efforts.
- Identify the tools, resources, and capital needed to advance a more just, equitable, and inclusive learning experience for our youth, teachers, and communities.
- Identify what needs to happen in the next phase of implementation.

Meeting Design Elements

Make Equity a Priority

Attend to Coherence

- Student Learning Experiences
- Professional Learning
- Curriculum
- Assessment
- Infrastructure

Where We Have Been: October Sessions

- Day 1
  - Framing – How we got here
  - Landscape of Implementation
  - Role of Leadership
- Day 2
  - Centering Student Experiences
  - Teacher Preparation
  - Professional Development

What We Have Left: Agenda Preview

Panel: *Curriculum and Instructional Materials*

11:15 am – 12:45 pm ET

Panel: *Assessment as a "Caring Practice"—Systems of Assessment*

1:15 pm – 2:15 pm ET

Breakout: *Tools and Resources for Building Coherence*

2:45 pm – 3:45 pm ET

Open Discussion: *Breakout Reporting and Reflection*

4:00 – 5:00 pm ET

More to Come!

- Coffee Talks!
  - **January 18:** A Review of the Numbers
  - **February 16:** Rural Implementation Efforts
  - **March 16:** Instructional Shifts
  - **March XX:** Informal Partners
  - **April XX:** Teacher Preparation Pathways
- Reflection Papers
- In-person April 26

Norms for Engagement

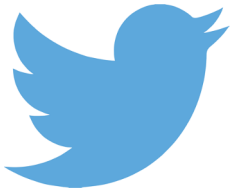
Audio	Make sure that you are always muted.	Please listen generously and respectfully.
Chat	We encourage active engagement in the chat.	Be respectful.
Q & A Box	Please enter your questions for panelists here.	We will **NOT** be scanning the chat for questions.
Slido	Polls have been incorporated throughout the event.	We will **NOT** be using the Q&A function.

Let's try a few polls! The chat includes the link to Slido.

Get Social

The event will be using the hashtag #scistandards on twitter, so we encourage you to follow, join and stay engaged in the conversation.

Or join us for the #sciencestandardsslowchat



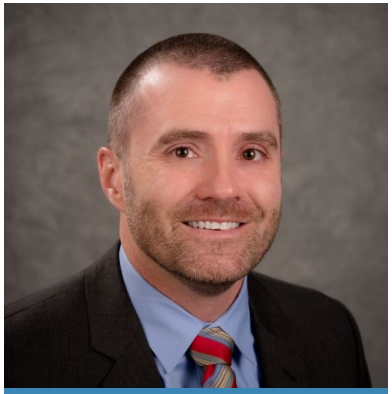
Chat Question

What is something from the previous October sessions that you still resonate with?

Curriculum and Instructional Materials

Sam Shaw
Ed Reports

Panelist: Philip Bell
University of Washington



Panelist: Corey Epler
Nebraska Dept of Ed

Panelist: Doral Kastel
New Visions for Public Schools

Panelist: Spencer Martin
Kansas City Pulic Schools

Panelist: Carol O'Donnell
Smithsonian Science Education Center

Panelist: Jamie Rumage
Oregon Dept of Ed

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Slido Poll

Public opinion of the NGSS is high. A recent study published by AERA found that the NGSS is popular with educators, and that feeling of positivity continues to increase year over year in both NGSS and non-NGSS states.[1] But when it comes to instructional materials aligned to the standards, materials are not supporting this vision for science education.

In order for the instructional innovations laid out in the Framework and NGSS to take hold, teachers need high-quality instructional materials that support students to figure out a contextualized phenomenon or solve a problem using science ideas and practices rather than learning about an isolated science topic.[3]

The need for high-quality instructional materials is even more urgent given the growing recognition that instructional materials must attend to student diversity and equity while also supporting teacher professional learning.

~Campbell & Lee (JSTE Special Issue, 2021)

Instructional Materials: Next Steps

- Improve Review Process
  - Broad coalition of stakeholders
  - Look for evidence of student learning & change in teacher practices
  - Develop site for sharing effectiveness data
- Increase interconnection between supply, demand, and implementation
  - Partnerships
  - Representation
  - Coherence

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NASEM. (2018). *Design, Selection, and Implementation of Instructional Materials for the Next Generation Science Standards: Proceedings of a Workshop.* Washington, DC: The National Academies Press.

Horizon Data** Instructional Resources

Table 32
Science Classes for Which Various Types of Instructional Resources Are Designated,† by Grade Range

	PERCENT OF CLASSES		
	ELEMENTARY	MIDDLE	HIGH
Commercially published textbooks (printed or electronic), including the supplementary materials (e.g., worksheets, laboratory handouts) that accompany the textbooks	67 (2.9)	87 (1.8)	95 (0.9)
State, county, district, or diocese-developed units or lessons	43 (2.2)	32 (2.3)	27 (1.7)
Lessons or resources from websites that are free (e.g., Khan Academy, PhET)	20 (1.9)	26 (2.2)	25 (2.0)
Commercially published kits/modules (printed or electronic)	51 (2.7)	36 (3.1)	22 (2.0)
Lessons or resources from websites that have a subscription fee or per lesson cost (e.g., BrainPOP, Discovery Ed, Teachers Pay Teachers)	39 (2.7)	39 (2.8)	16 (1.5)
Online units or courses that students work through at their own pace (e.g., i-Ready, Edgenuity)	9 (1.2)	15 (2.0)	11 (1.8)

† Includes only those teachers who indicated that their randomly selected science class had an instructional material designated by the state, district, or diocese.

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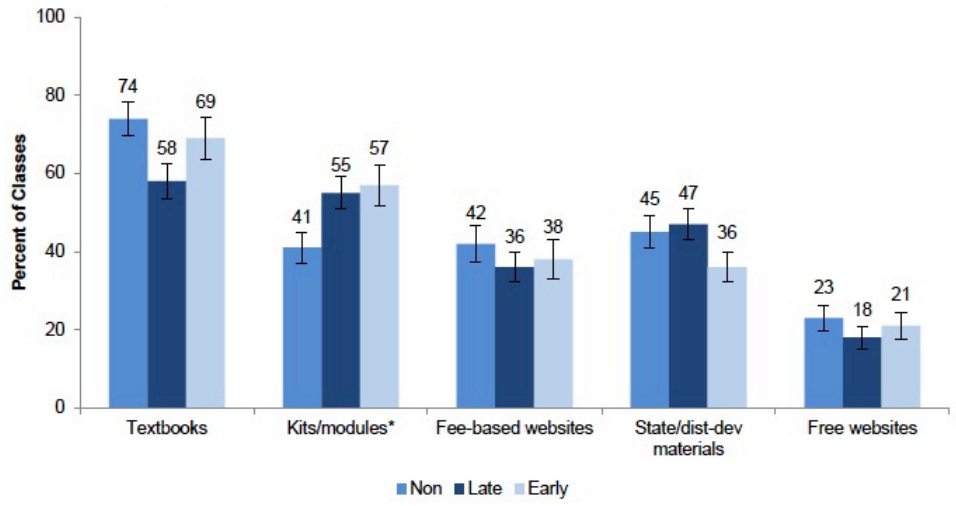
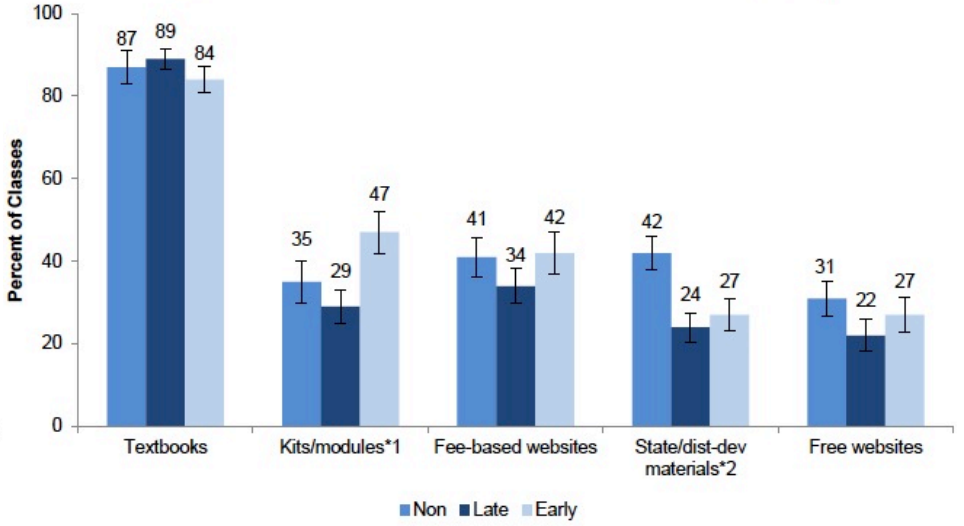
**At the time of data collection, very few NGSS-aligned instructional materials exist.

Horizon Data**
Designated IM: Grade x Adoption

Elementary Grades



Middle Grades



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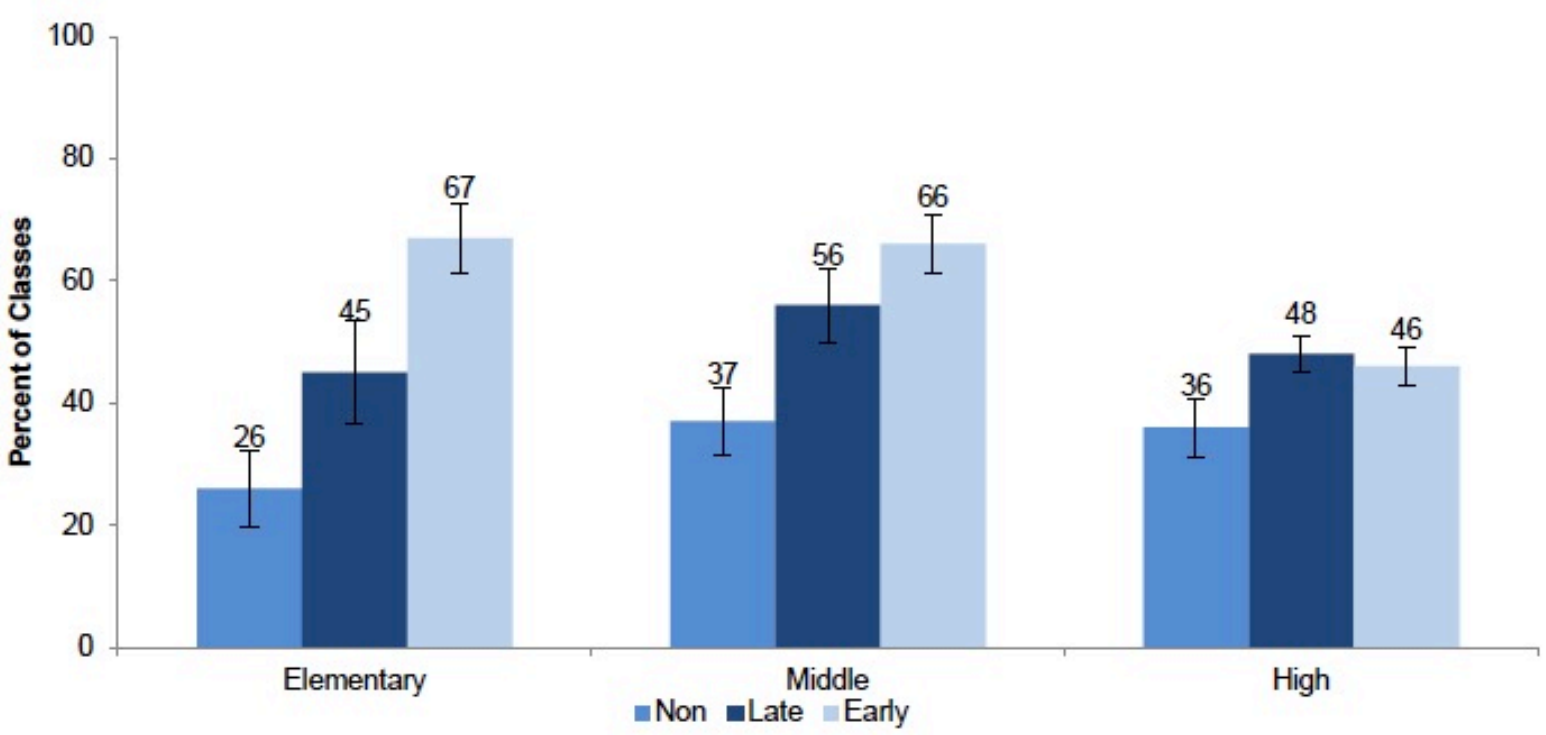
**At the time of data collection, very few NGSS-aligned instructional materials exist.

Horizon Data**

Textbooks/Kits/Modules Published 2009 or earlier



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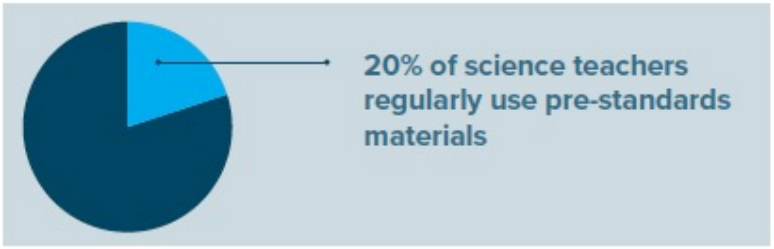
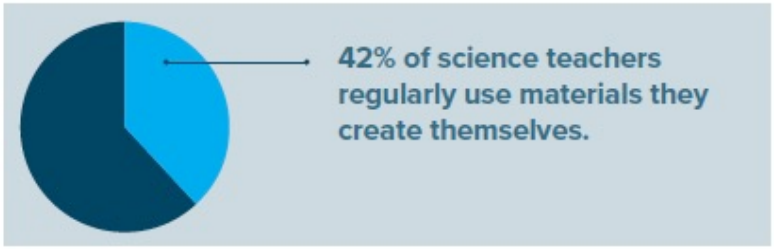
**At the time of data collection, very few NGSS-aligned instructional materials exist.

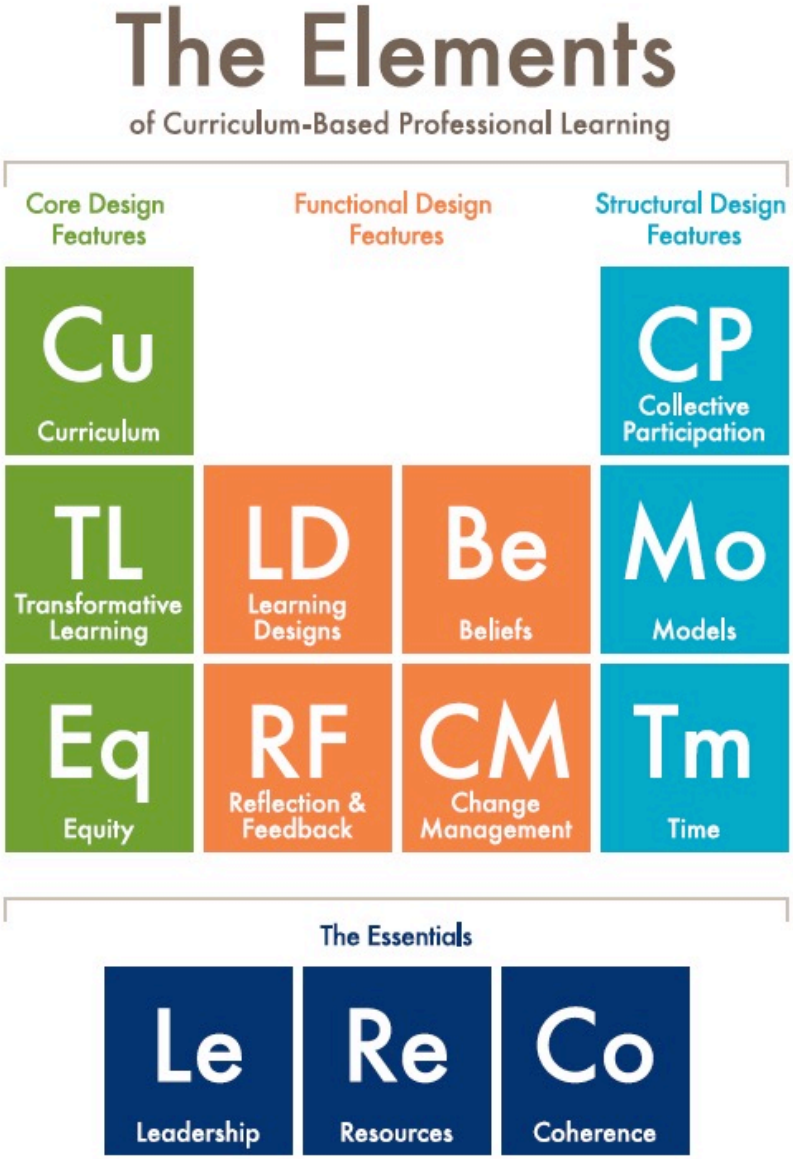
RAND Data





Survey Question: "This school year, how often have you participated in the following types of professional learning activities?"

	% by response category				
	Never	1-3 times per yer	4-6 times per year	1-3 times per month	Weekly or more often
Workshops or trainings focused on use of my main science materials	50%	44%	5%	1%	0%
Coaching focused on use of my main science materials	69%	24%	3%	2%	1%
Collaborative learning with other teachers (e.g., Professional Learning Communities) focused on use of my main science instructional materials	35%	28%	11%	13%	13%



Elements -- expectations & actions school/district leaders, curriculum developers, & teacher development organizations take to promote & design curriculum-based professional learning

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Written by Jim Short & Stephanie Hirsh (2020). A Challenge Paper from Carnegie Corporation of New York.

JSTE Special Issue

- Articles
  - Aligned for All students, including ELs
  - Project-based learning contexts
  - Support large-scale transformation
  - Storyline Units
- Commentary
  - Progress through purposes, policies, programs, & practices
  - Supporting teachers' professional learning & bringing teachers to the table
  - Intellectual virtues, lived experiences, & just learning & teaching

Chat Question

What might you add to panelist responses to the following question:

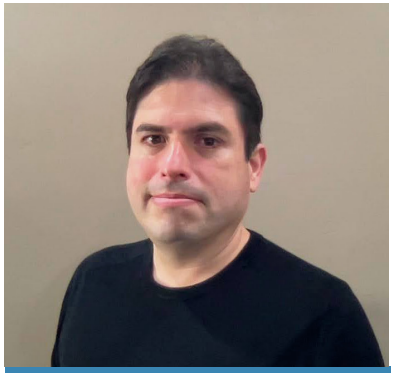
Where do we want to go next and what are the opportunities ahead when thinking about the localization of materials?

We are heading to break. We will return at 1:15 pm ET.

Stay engaged in the conversation: #scistandards

Assessment as a "Caring Practice"
Systems of Assessment

Aneesha Badrinarayan
Learning Policy Institute



Panelist: Daniel Alcazar-Roman
Lawrence Hall of Science

Panelist: Alec Barron
San Diego Science Project

Panelist: TJ Heck
Michigan DoE

Panelist: Angela Landrum
Colorado DoE

Panelist: Jim Pellegrino
University of Illinois at Chicago

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Slido Poll

We are heading to break. Plan to join your **breakout group zoom** at 2:45 pm ET.

Stay engaged in the conversation: #scistandards

Meet the Group Reporters

Moderator: Heidi Schweingruber
NASEM

Reporter: Andres Bustamante
University of California, Irvine

Preschool to Elementary Transition

Reporter: Christine Cunningham
Pennsylvania State University

Curriculum and Instructional Materials

Reporter: Sara Cooper
Independent Consultant

Formative Assessment

Reporter: Kate McNeill
Boston College

Instructional Practice

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Chat Question

What is one insight you had today?
Or one new thing you learned?

Reflections on the Day

That's a wrap!

Thank you for your participation throughout the day.

Look at for the Coffee Talk Series, Reflection Papers, and the in-person event.