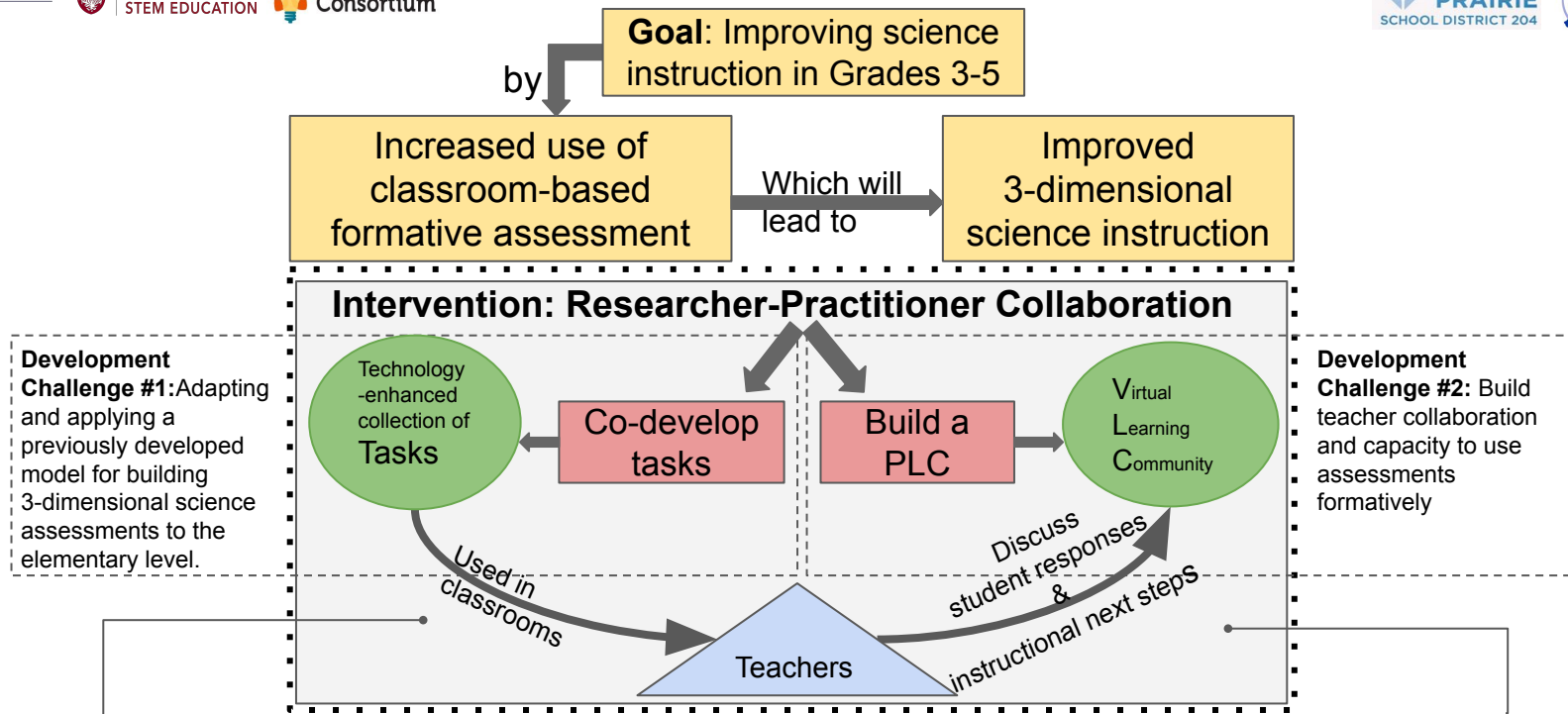


Improving Multi-dimensional Assessment and Instruction: Building and Sustaining Elementary Science Teachers' Capacity Through Learning Communities

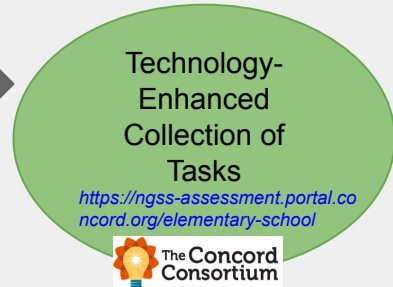
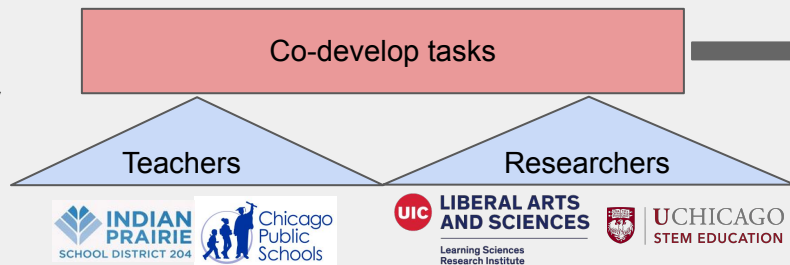


Research Question #1: How well do these assessments function with respect to aspects of validity for classroom use, particularly in terms of (a) indicators of student proficiency and (b) tools to support teacher instructional practice?

Research Question #2: In what ways do providing these assessment tasks and rubrics, and supporting teachers in their use, advance teachers' use of formative assessment to support 3-dimensional science instruction?

Development Challenge #1

Development Challenge #1: Adapting and applying a previously developed model for building 3-dimensional science assessments to the elementary level.



Previously developed model for building 3D assessments in **middle school** physical and life science



Adaptations

- **Translating** an evidence-centered design (ECD) process for teachers to participate in co-development
- Developing **scaffolds** for teachers to work through the design process
- Identifying **which stages of the design process** are best for teacher collaborator involvement
- Using **teachers' classroom expertise** in **selecting phenomena** for tasks
- Adapting to **grade-specific issues** in reading, writing, and technology use
- Developing tasks for a **new NGSS discipline** (Earth and Space Science)

Products: Tasks + Rubrics

Performance Expectations Covered

Physical Science	Life Science	Earth & Space Science
3-PS2 Motion and Stability: Forces and Interactions	3-LS1 From Molecules to Organisms: Structures and Processes	3-ESS2-1 Earth's Systems
4-PS3-3 Energy	4-LS1 From Molecules to Organisms: Structures and Processes	4-ESS2-2 Earth's Systems
5-PS2 Motion and Stability: Forces and Interactions	5-LS1 From Molecules to Organisms: Structures and Processes	5-ESS2-2 Earth's Systems

Elementary Task Portal

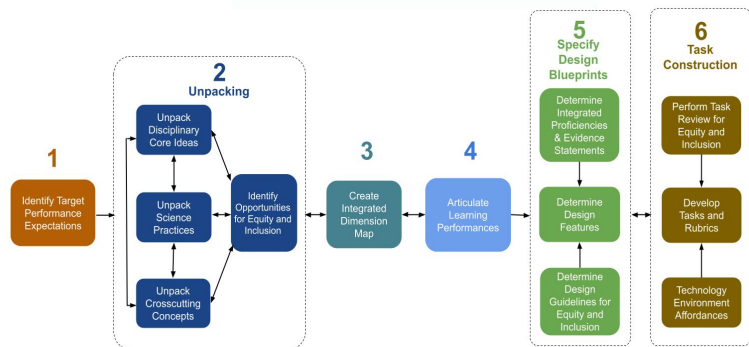
<https://ngss-assessment.portal.concord.org/elementary-school>



Assessment Tasks Forum Register Log In

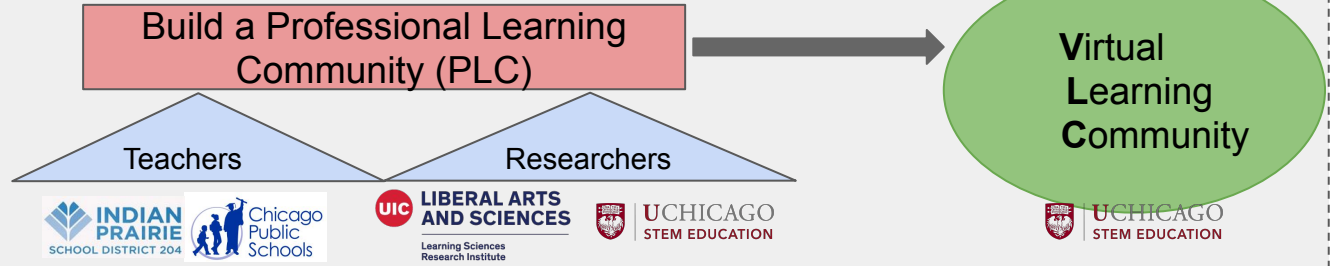
Elementary Grades (3-5) Assessment Tasks

The tasks are organized by grade and Performance Expectation (PE). For each PE, we present a set of less broad but more manageable three dimensional performance statements that we call Learning Performances (LPs), which collectively describe the performances that students need to demonstrate as they progress toward achieving that PE. For more detail about the design process used to develop these tasks go to nextgenscienceassessment.org/design-process



Development Challenge #2

Development Challenge #2:
Build teacher collaboration and capacity to use assessments formatively



Professional Learning, 2019-20

Co-design of assessment tasks

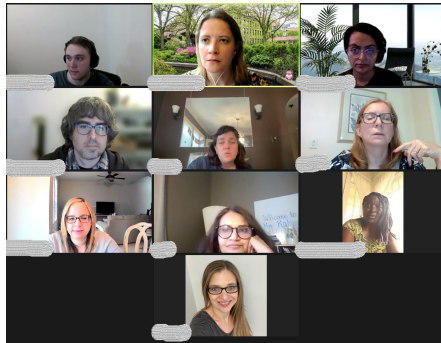
- Unpacking and sensemaking around specific NGSS PEs
- Discourse around what students would say or do to communicate their knowledge and skills
- Focus on connecting task phenomena and language to students' interests and experiences



Professional Learning, 2021

Using assessments in the classroom

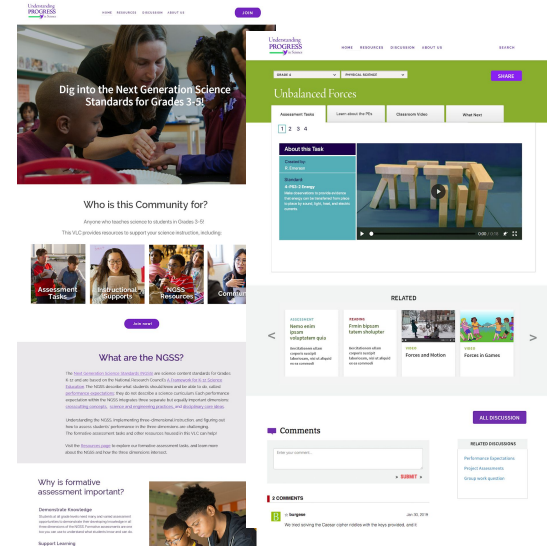
- Selecting and using tasks to elicit student responses
- Interpreting student responses
- Using student responses to inform subsequent teaching



Teacher Collaborators reported

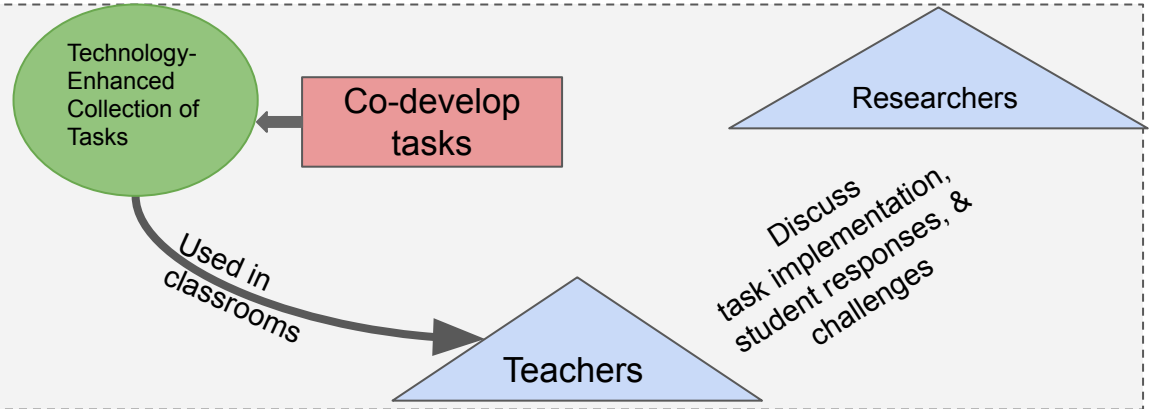
- Increased enjoyment teaching science
- Deeper understanding of the NGSS, including more disciplinary content knowledge and a more thorough understanding of the SEPs
- Changes in their views and use of assessment for learning
- Increased feeling of connectedness to other project members
- Increased comfort in reaching out to others to discuss science teaching

Virtual Learning Community (Under Development)



Research Question #1

Research Question #1: How well do these assessments function with respect to aspects of validity for classroom use, particularly in terms of (a) indicators of student proficiency and (b) tools to support teacher instructional practice?



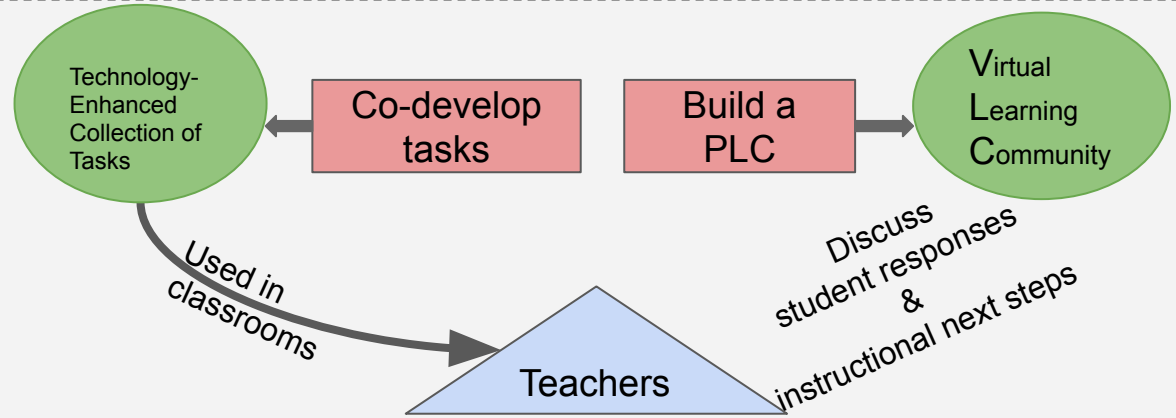
Primary Data Sources

- External reviews of assessment tasks
- Cognitive lab studies using assessment tasks
- Interviews, reflections, and/or debriefings with teachers after using assessments

- 9 reviewers; each task reviewed by 3 reviewers
 - Diverse expertise: current & former educators, science education researchers, assessment developers
- Multiple criteria for review, including alignment to assessment targets and comprehensibility and/or language issues.
- External reviews analyzed and used to inform task revisions
- Postponed (COVID & remote learning presented barriers)
- Some teachers were able to use tasks during remote learning
- Reflections & discussions with teachers focused both on teachers' goals for use (i.e., pre-implementation plan) and reflecting on what worked well and where students struggled (i.e., post-implementation reflection)

Research Question #2

Research Question #2: In what ways do providing these assessment tasks and rubrics, and supporting teachers in their use, advance teachers' use of formative assessment to support 3-dimensional science instruction?



Growing the PLC to answer RQ #2

- 2nd cohort of teachers (**Teacher Implementers**) will begin in AY 2021-22 and continue through AY 2022-23
- Teacher Implementers will use the tasks and rubrics that have already been developed
- Emphasis on using student responses from tasks to inform subsequent instruction

Primary Data Sources

Classroom observation field notes	Pre/post questionnaire	Pre/post interviews
<i>Goal:</i> learn how teachers' are using these tasks in their classroom to support students' learning	<i>Goal:</i> identify aspects of 3D instruction and how teachers felt the assessments support such instruction	<i>Goal:</i> understand context around teachers' use of assessments and different models for use
<i>Timing:</i> ongoing, during teachers' task implementations	<i>Timing:</i> Start and end of each AY	<i>Timing:</i> Start and end of each AY