2018 CYFS Summit on Research in Early Childhood

Preschool Science Talk in Action and Reflection (PreSTAR)

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Research Assistants

Erin Hamel, Anna Burton UNL

Patricia Pastorello Brazil

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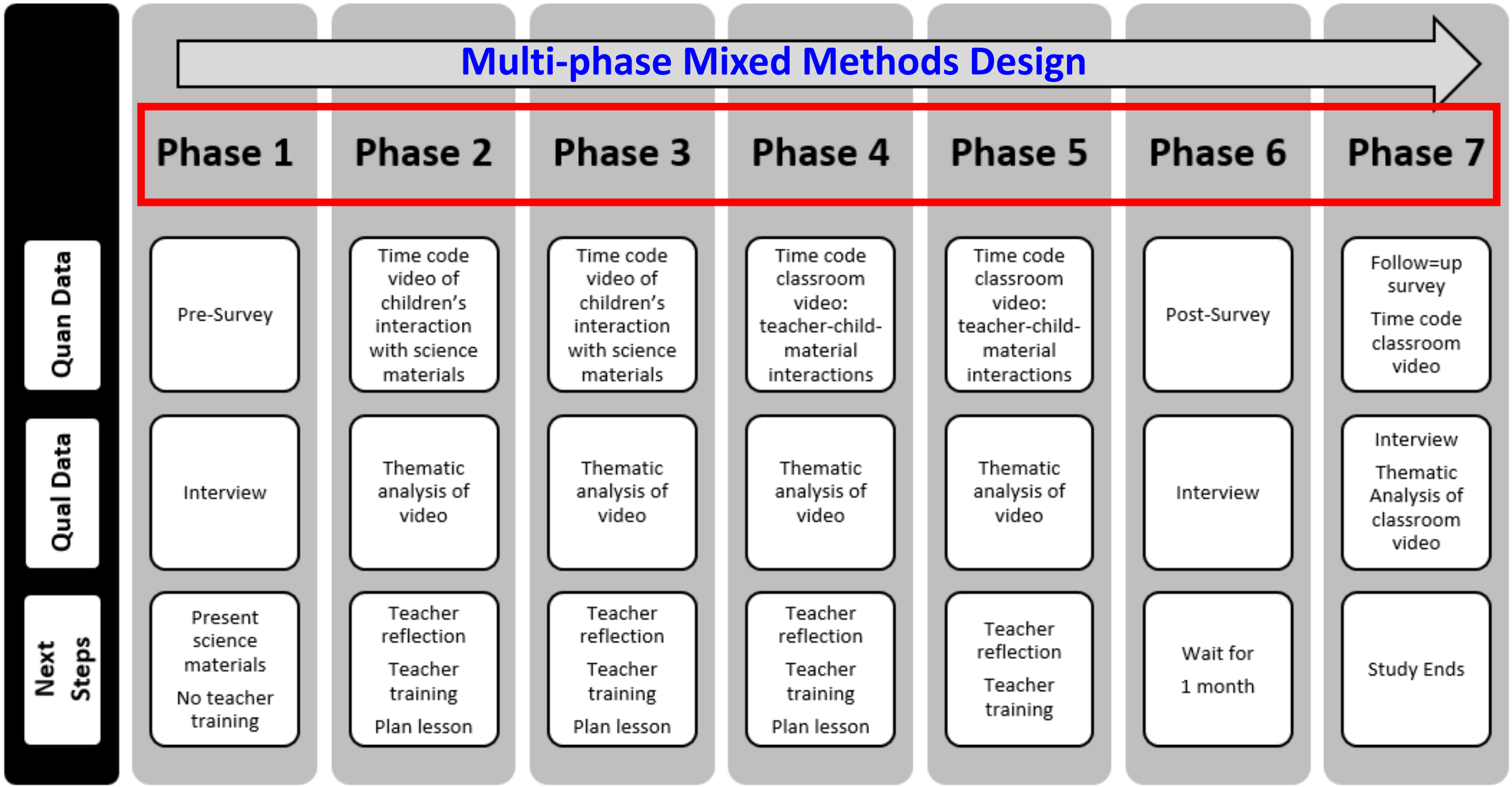
Purpose

- Learn preschool teachers' ideas about using science in the classroom
- Examine the change in
  - the quality of teachers' reflection on children's interactions with science materials;
  - the quality of teachers' science talk; and
  - children's science talk and level of engagement

Teachers and Children

- 4 preschool teachers at 3 centers
  - 2 Head Start and 1 community child care programs
  - Teacher education Level:
    - 2 MA/MS in Physical Education, Special Education
    - 1 BA/BS in Early Childhood
    - 1 Associate degree in Child Development
- 26 children aged 4 and 5
  - 2 from Spanish-speaking families
  - 1 from Arabic-speaking family
- Content focus: Physical science

Research Design



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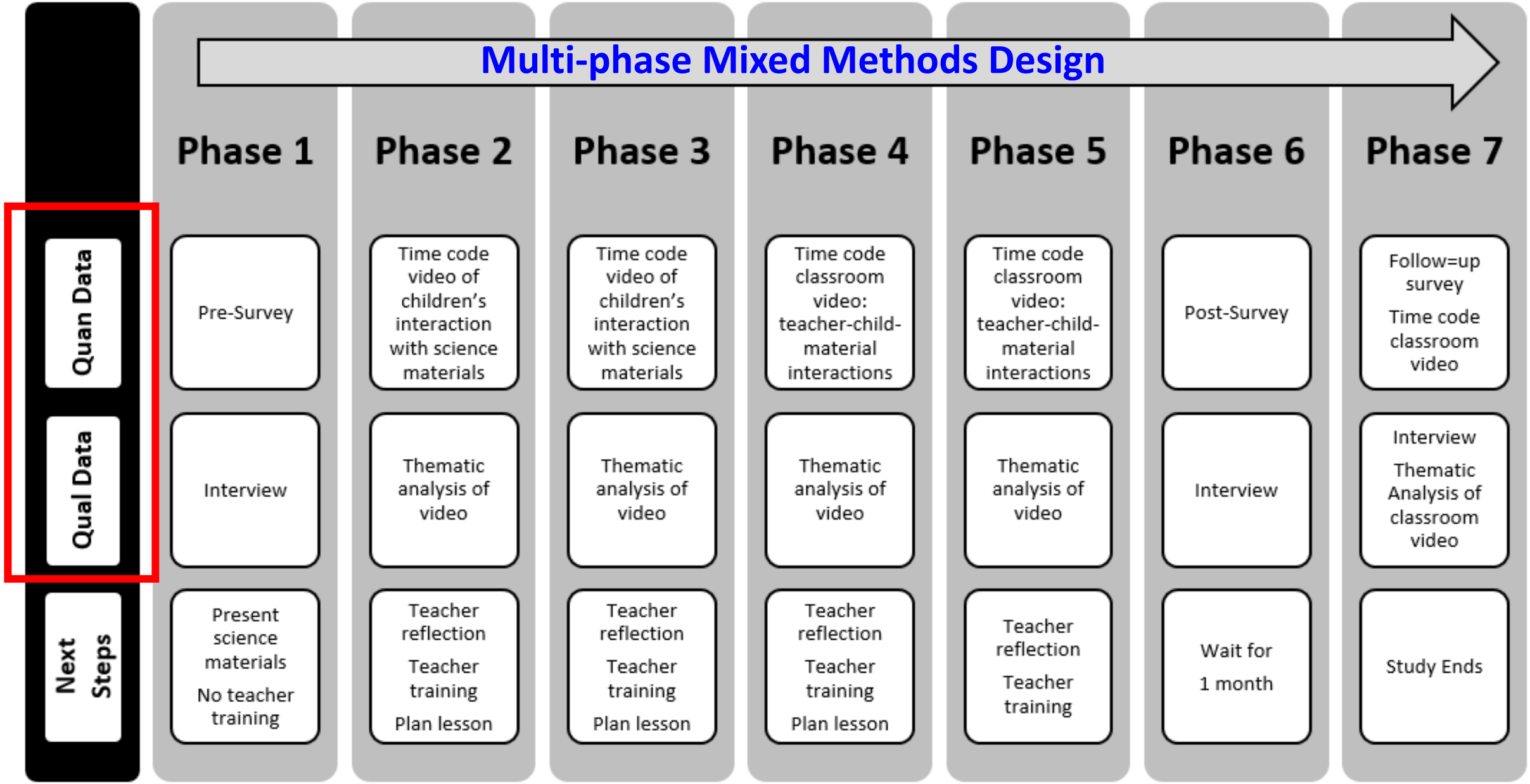

Procedure

Phase	Tasks
Phase 1	Teacher Interview + Survey + Observation (Time 1)
Phase 2 Phase 3	Observations of and reflections on children's interactions with materials
Phase 4 Phase 5	Observations of and reflections on teachers' interactions with materials and children
Phase 6	Teacher Interview + Survey (Time 2)
Phase 7	Follow-up Interview + Survey + Observation (1 month after Phase 6)

Procedure

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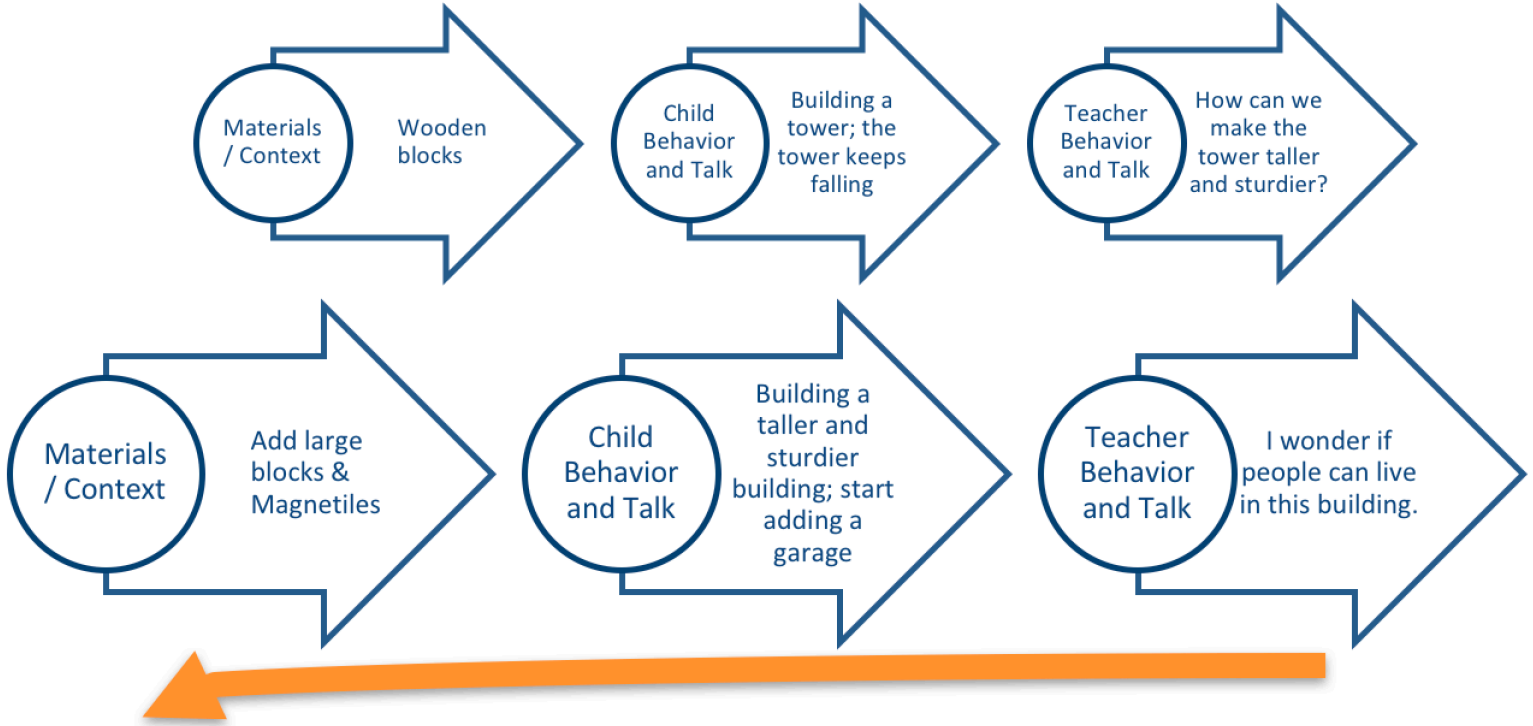
Reflective Practice: Cycle of Inquiry

- Reflective practice begins with teachers' observation of children's behavior.
- Interesting materials provoke creative thinking in children.
- Observation and reflection inform planning and practice.

Adapted from Gandini & Edwards (2001)

Inductive Thinking Framework



Phase 1: Interview and Survey

- Survey: Attitudes and beliefs
  - Preschool Teachers' Attitudes and Beliefs Towards Science Teaching questionnaire (P-TABS: Maier et al., 2013)
  - Teacher Comfort; Child Benefit; Challenges
- Survey: Classroom Environment and Practice
  - Science materials and activities available in the classroom (Tu, 2006)
- Interview:
  - Confidence; Challenges; Background; Planning; Integration with other content areas; Goals and wishes; Parent engagement; Advocacy

Phases 2 & 3: Observation and Reflection

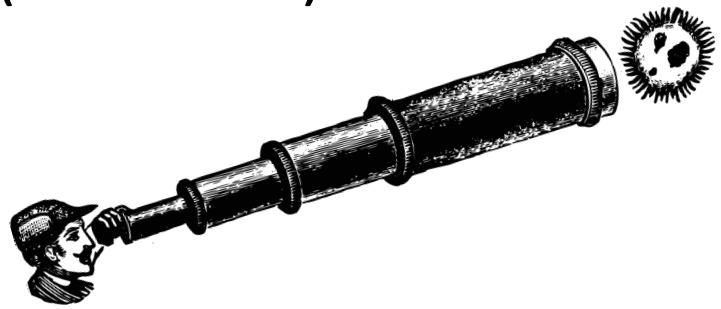
- Observation of children's interactions with science-related materials and peers
  - Two 10-minute video clips taken by teacher
  - Researchers review them and take notes
  - Teachers review and reflect on them
- Reflection meeting (30-40 minutes)
  - Researchers and teachers reflect on video clips
  - Researchers provide additional information
    - Standards & Objectives, Cycle of Inquiry, Inductive Thinking Process, Lesson planning
  - Reflection notebook pages provided for the next phase.

Preliminary Findings

- Teacher attitudes toward teaching science
  - Science = Teacher-led activity; Takes various materials
  - Incorporating science is important; but unsure how to do that.
- Discrepancy in attitudes reported on survey vs. interview
  - High confidence & low challenge (survey) vs.
  - Low confidence & high challenge (interview)

"Mostly, it will be like the teacher leading and the kids saying, 'Okay' which makes it more like an observation instead of a hands-on."

"That is a good question. Not that many. We really need to incorporate more, but we really… don't. I guess we need to learn how!"



Preliminary Findings

- Initial reflections on children's play
  - Shared mostly lower-level reflections (i.e., description of what children do with materials)
  - Recognized broad ideas without much elaboration
  - Started to brainstorm what would provoke children's thinking when given specific prompts

"What rolls and what doesn't. what moves. Flat surface rather than ramps. Oh, my! Trial and error. Balancing, yeah. measurement. He is comparing it. Again, trial and error. Experimenting. Weight. Balance. Measuring. Didn't fit. Will try a different size."

"He tried to get [the car] go [on the ramp] on that side. Part of the problem was the car, I think, because the car has a kind of funny front, so it wouldn't jump off that. He just couldn't get [the car] to go, and he kept saying, 'ugh!'"

"Maybe bring over different sizes of chairs to make the angle different and see if he gets a desired outcome." "Maybe some different kinds of rubber balls and see which one is faster… or even different shapes, like square…"

Discussion

- How do teachers define science in a preschool classroom?
- How can we support teachers in…
  - creating opportunities to incorporate science talk in various areas of their classroom?
  - Using their observations of children's interactions with materials to intentionally plan for science opportunities?
  - building capacity to generate high-level reflections on children's behavior and teachers' own practices?

Thank you!

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