

WARM UP

What kind of instruction builds
Mathematical Practice 1?

*“Make sense of problems and
persevere in solving them.”*

Please make notes on:

1. How instruction helps students develop Mathematical Practice 1
2. How teachers learn to do such instruction

Using Lesson Study to Build School-wide Improvement of Mathematical Practices

NCTM

April 14, 2016

Stephanie Ervin, San Francisco USD

Courtney Ortega, Oakland USD

Discussants:

Catherine Lewis (Mills College)

Akihiko Takahashi (DePaul University)

OBJECTIVES

Participants will:

- Learn how lesson study can drive **school-wide** professional learning.
- Deepen ideas about instruction that supports **mathematical practices**.
- Find out about **key learnings** to improve and examine instruction.

What is Collaborative Lesson Research, and how is it different from other models of lesson study?

Akihiko Takahashi and Catherine Lewis

13 Schools from Oakland Unified School District, San Francisco Unified School District and Chicago Public Schools are participating in Collaborative Lesson Research to Build the Common Core

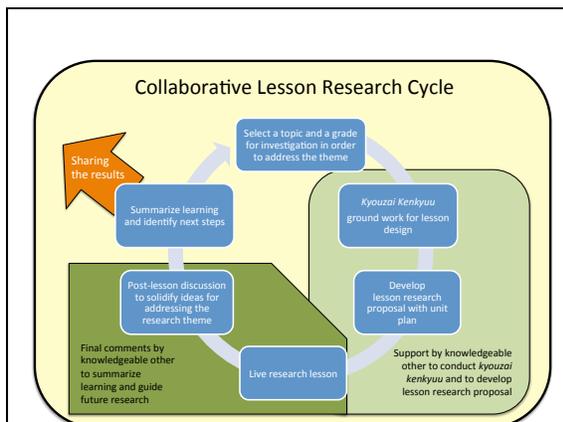
**BILL & MELINDA
GATES foundation**

This material is based upon research supported through funding by the Bill & Melinda Gates Foundation. The views, findings, conclusions, and recommendations expressed herein are those of the authors and do not necessarily express the viewpoint of the foundation.

Collaborative Lesson Research (CLR)
is a School-based, Systematic form of Lesson Study

We define Collaborative Lesson Research (CLR) as
having the following components:

1. A clear research purpose (school research theme)
2. *Kyouzai kenkyuu* (study of content and materials)
3. A written research proposal (includes lesson plan)
4. Live research lessons and post-lesson discussions
5. Knowledgeable others (e.g., final commentator)
6. Sharing of results within and beyond school



- ### Key Learnings
1. Start with the conditions
 2. Learning happens over time
 3. A rich task is not enough
 4. Need multiple lenses: specific content (What), Math Practices (How), and students (Who)
 5. Connecting the dots creates a stronger **throughline** to student achievement

- ### 1. Conditions for Learning
- Video: Dr. Takahashi, Muir Elementary School, SFUSD, grade 5 classroom
 - Unit/Lesson: How to represent various ways of counting using mathematical expressions

Video

- Notice: What features of instruction are helping students build Mathematical Practice 1: "Make sense of problems and persevere in solving them?"

The diagram shows a triangle with "teacher" at the top, "students" at the bottom left, and "mathematics" at the bottom right. Arrows connect each vertex to the other two. This triangle is enclosed within two concentric circles, both labeled "contexts".

1. Conditions for Learning

During the lesson series, students were quite willing to learn from their mistakes and to improve.

- *What would it take for adult educators to display this same vulnerability?*
- *What are the implications for central office support?*

**Collaborative Lesson
Research
is
illuminating the conditions
needed!**

1. Conditions for Learning

Shifts in Mindset

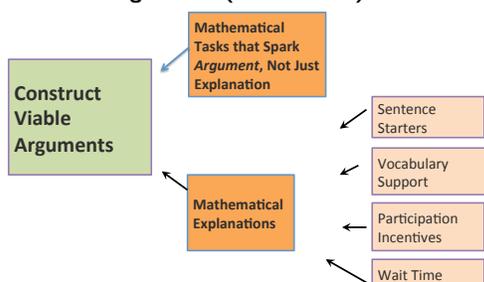
- From getting the right answer/doing the right thing to inquiry/growth mindset
- Learning **will** involve taking risks, making mistakes, and sometimes failing
- Openness to hear challenging feedback –cognitive dissonance

2. Learning Happens Over Time

"I try to remind myself that we should try to look for **growth over time**. For whatever it is that we are focusing on, how can we think about how that is evolving over the course of the school year or even the course of the next couple of years. So it is a weird uneasy feeling where we feel like we should walk away with this one thing that we are learning."

- Scott Corwin, Edna Brewer Middle School, OUSD

Improving our Theory of How to Build Viable Arguments (from OUSD)



3. A Rich Task is Not Enough

"It can't just be any lesson. Sure it needs to be something rock solid and important, but we are not going to go through all this trouble if it is not in service of something that really stinking matters to us. If it is not a question that is really compelling, then it's not going to work."

- Brigid Brown, Acorn Woodland Elementary School, OUSD

Bret Harte Middle School, OUSD
2016 Winter Lesson Study Cycle

Research Theme	Research Lesson
By supporting students' ability to express and connect ideas in multiple ways, they will become better problem solvers.	Math 8 Unit 4 Linear Relationships Formative Task: "We Are Family"

GRAFICA A

x	y
-3	$7\frac{1}{2}$
-2	$7\frac{1}{2}$
-1	$7\frac{1}{2}$

GRAFICA B

x	y
-3	$-1\frac{1}{2}$
-2	-1
-1	$-1\frac{1}{2}$

$y = -\frac{1}{5}x - 2$ $y = 0x + 4$

"We Are Family"

Bret Harte Middle School, OUSD
2016 Winter Lesson Study Cycle

Research Theme	Research Lesson
By supporting students' ability to express and connect ideas in multiple ways, they will become better problem solvers .	Math 8 Unit 4 Linear Relationships Formative Task: "We Are Family"

4. Multiple Lenses: Specific Content (**What**), Math Practices (**How**), and Students (**Who**)

4. Multiple Lenses: Specific Content (**What**), Math Practices (**How**), and Students (**Who**)

"It's about feeling really comfortable with what your research question is, and that is what your ultimate assessment is. If that is what you want **the story of your students** for the year to look like, then how are you using that to push along all of these lesson study cycles?"

- Zinia Gangopadhyay, Acorn Woodland Elementary School, OUSD

5. The Throughline to Student Achievement

Cross-Site Collaboration

Cross-district collaboration

Want to learn more?

Contact any one of us

- ERVINS@sfusd.edu
- courtney.ortega@ousd.org
- clewis@mills.edu
- takahash@mac.com

Resources to Support School-wide CLR

- <http://www.lessonresearch.net/http/>
Tools for lesson research proposal, research theme, etc.
- LessonNote: Tablet Based Lesson Observation Tool
Free App for iPad and iPad mini from Apple App Store.
<http://www.lessonnote.com>
- Matsuzawa School Report (ex. of school CLR report)
<http://www.impuls-tgu.org/en/resource/readings/page-26.html>

Resources on CLR

- Takahashi, A., & McDougal, T. (2016). Collaborative lesson research: maximizing the impact of lesson study. *ZDM*, 1-14. doi:10.1007/s11858-015-0752-x
- Takahashi, A., & McDougal, T. (2014). Implementing a New National Curriculum: A Japanese Public School's Two-Year Lesson-Study Project. In A. R. McDuffie & K. S. Karp (Eds.), *Annual Perspectives in Mathematics Education (APME) 2014*: National Council of Teachers of Mathematics.
- Lewis, C., Perry, R., Hurd, J., & O'Connell, M. P. (2006). Lesson Study Comes of Age in North America. *Phi Delta Kappan*, 88(04), 273-281.
- Lewis & Hurd (2011). *Lesson study step by step*. Heinemann.