Seeking a Deeper Understanding: Lessons Learned from Lesson Study

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How can we support elementary teachers and teams in adapting our existing Board adopted curriculum to be more student-centered, problem solving focused, cognitively demanding, and as such, build ownership in alignment with our Vision for Mathematics?

The Dilemma:

How to adapt MX to fit a problem solving structure?

"Mathematically good enough, but it's tedious, boring, tiresome. The cognitive science is good, but it translates into a pedagogy that undermines the cognitive science."

--Phil Daro
The Lesson Study Process

Kyouzai Kenkyuu

"U.S. curriculum is like a buffet, don't even think about eating everything or you'll be sick" - Akihiko Takahashi

- Curriculum: Make decisions about unit design to maximize student learning based on math standards, the big mathematical idea of the unit, research, and learning progressions.
- Lesson Design: Design a lesson using problem solving structures to build conceptual understanding.
- The Math: Develop an understanding of equivalent fractions.

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The Research Lesson - Boardwork

- Students work collaboratively to determine which has a greater shaded area.

One student creates eighths from the fourths to find equivalent fractions. Yes!

Our Learning:

- Curriculum: Take the time to deeply understand the standards and progressions so that you know what to emphasize, what to skip, and understand how ideas build.
- Lesson Design: You don't have to do everything in the lesson. Choose one juicy problem and release the authority to the students. Trust them to engage in mathematical thinking, and don't over scaffold. Anticipating their responses helps you sequence student responses and move towards the learning goal.
- The Math: The algorithm for finding equivalent fractions should be derived from student thinking and connected to a visual representation. This takes time, you need to build from a third grade understanding to fourth grade.

Some Outcomes

- Update unit planning guide to support teachers in making decisions about unit progression based on key math ideas.
- Create a lesson planning template for Math Expressions that aids teacher decision making.
- Make recommendations for 4th grade unit 7 in core curriculum.