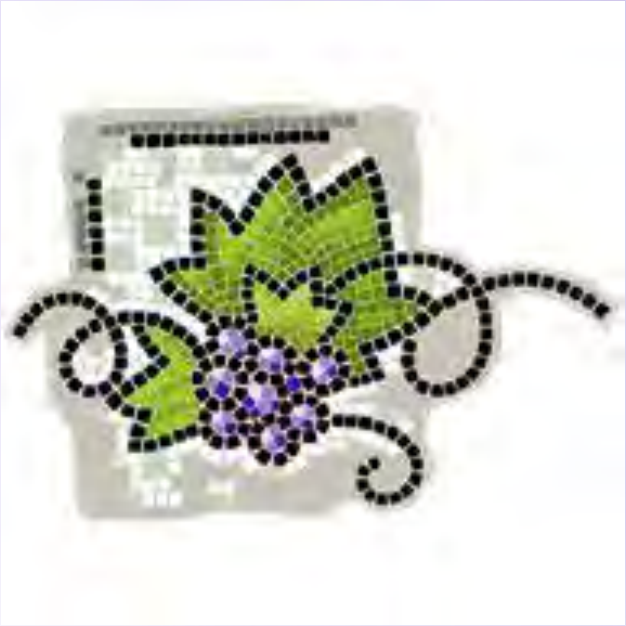
Welcome!



RAMP-A
March 21, 2014

Theme: ***What and how do we learn from each other?***

Goals for the day

- Unpack a math task to better understand learning math with focus and coherence.
- Consider the roles of others in our learning, and our role in their learning.
- Look at some math tasks for their characteristics.
- Work on your Learning Study.

*Collaboration

Collaboration

* Share viewpoints,
* Adopt a tentative stance towards own practice,
* Explore each others' ideas,
* Progressive refinement of shared understandings,
* Analysis of topic includes criticality and respect,
* Support claims with evidence and reasoning.

* Looking for Focus & Coherence

* Growing Rectangle

Learning with focus

- More time spent on a big idea so that it can be **taught in more depth**.
- Understand procedures and concepts together.
- Seeing the underlying mathematical structure.
- Search for focus in the organization and standards. For example:
  - The algebra domain *Reasoning with Equations and Inequalities* describes learning procedures with understanding,
  - The function domain *Linear, Quadratic, and Exponential Models*, describes understanding structure.

Learning with Coherence

* To **make sense** means that students understand:

  "One hallmark of understanding is the ability to justify, in a way appropriate to the student's mathematical maturity, *why* a particular mathematical statement is true or where a mathematical rule comes from" (p. 4, CCSS).

* Coherence as **connected** means that students understand and use natural connections between mathematical ideas.

* Connections between concepts and between concepts and procedures become as explicit as the concepts themselves.

* Do the task as you would expect students to do it. Consider a continuum of students from the weakest to the strongest mathematically, and some nuances in between, to develop examples of several students' work.

* What would your students do?

* Meet in groups by SMP

* Round 1

* Consider student work and the mathematics through your SMP.

*Whole Group Sharing

Round 2: Concept

- Unpack focus and coherence related to your concept:
  - linear function,
  - quadratic function,
  - exponential function,
  - rate of change,
  - graph,
  - table,
  - equation

*Whole Group Sharing

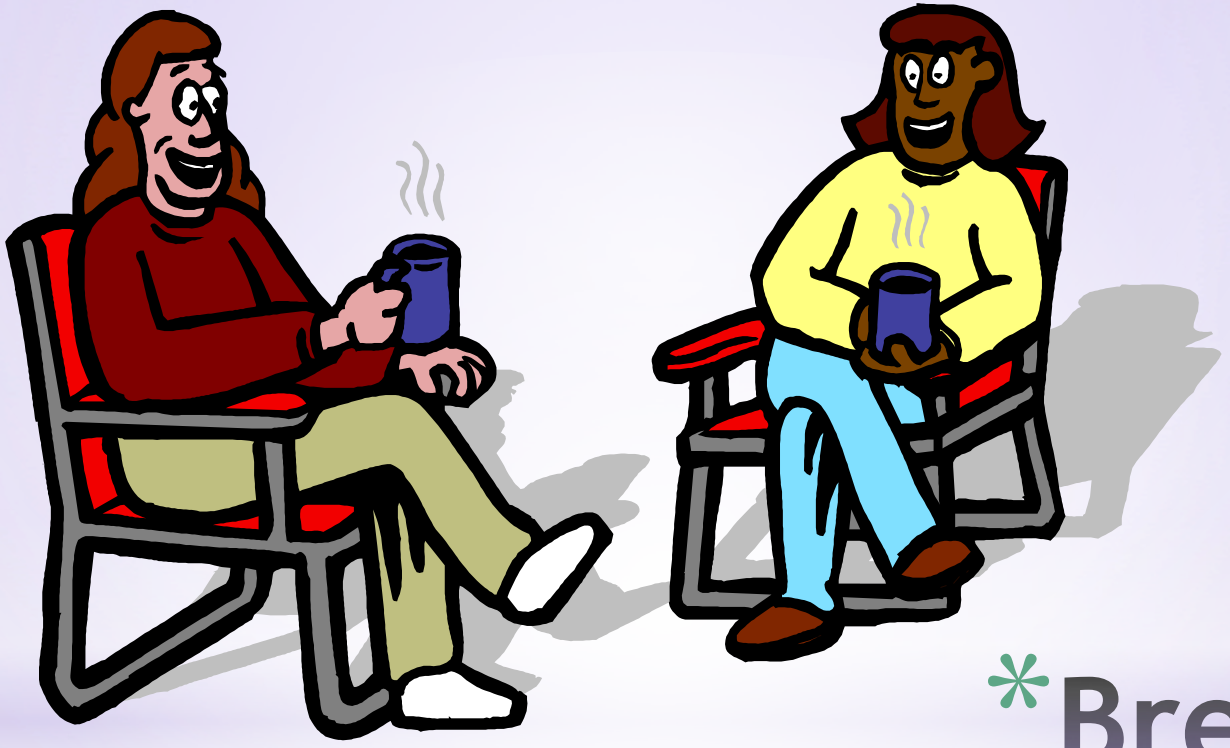
In your PLCs

* 1. Choose a couple of the difficulties that students could have with the task, and think back on your instruction of the related concepts and procedures. What could be possible causes of the difficulty or confusion?
* 2. Based on your discussion of prior instruction, how could instruction be improved so students solve the task with better understanding?

Reflection

- How did your thoughts on this task change:
  - Through the lens of an SMP?
  - Through the lens of one concept?
  - By thinking about your instruction?
  - Through collaboration with others?

* Find coffee and snacks



* Break!

Learning from Jo Boaler

Learning from Dan Meyer

Creating and implementing a task

Principal support of a PLC

*Lunch and Presentations

* Student trauma in math
  * Speed focus
  * Testing focus
  * Stereotype threat
    * Gender, race/ethnicity, socioeconomic status

* Boaler course learning

* Replace with tasks that emphasize
  * Openness
  * Different ways of seeing
  * Multiple entry points
  * Multiple paths/solution strategies
  * Clear learning targets and opportunities for feedback
* Formative Assessment
  * Comments, not scores or grades

* Boaler

*Helene

* What characteristics do we value in a task? How do these characteristics affect student learning?

* Beyond Cognitive Complexity

* Continue work on your learning study…

* Learning Study

* What questions do you have about the Learning Study?
* What resources do you need from us?

* Homework

* Thank you, as always for your candid feedback!

* Evaluations