Noticing in the Midst of Building on a Critical Event

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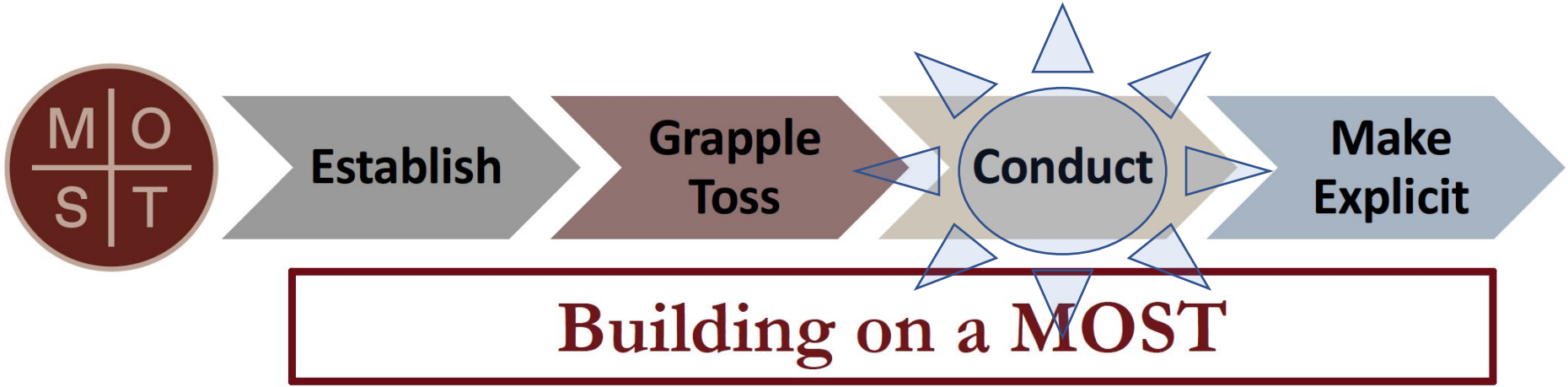
Framing the Issue

- Research on teachers' noticing of student mathematical thinking has tended to focus on the noticing of a singular event
- This view doesn't take into account the complex noticing that a teacher engages in during responsive teaching (Robertson et al., 2016)
- We developed a framework to help teachers determine which student thinking provides a mathematical "critical event"—a MOST (Leatham et al., 2015)
- Capitalizing on a MOST requires the teacher to engage in an iterative noticing process as other students contribute their ideas to make sense of that MOST

How do teachers need to engage in noticing activities to keep the class focused on making sense of a MOST?

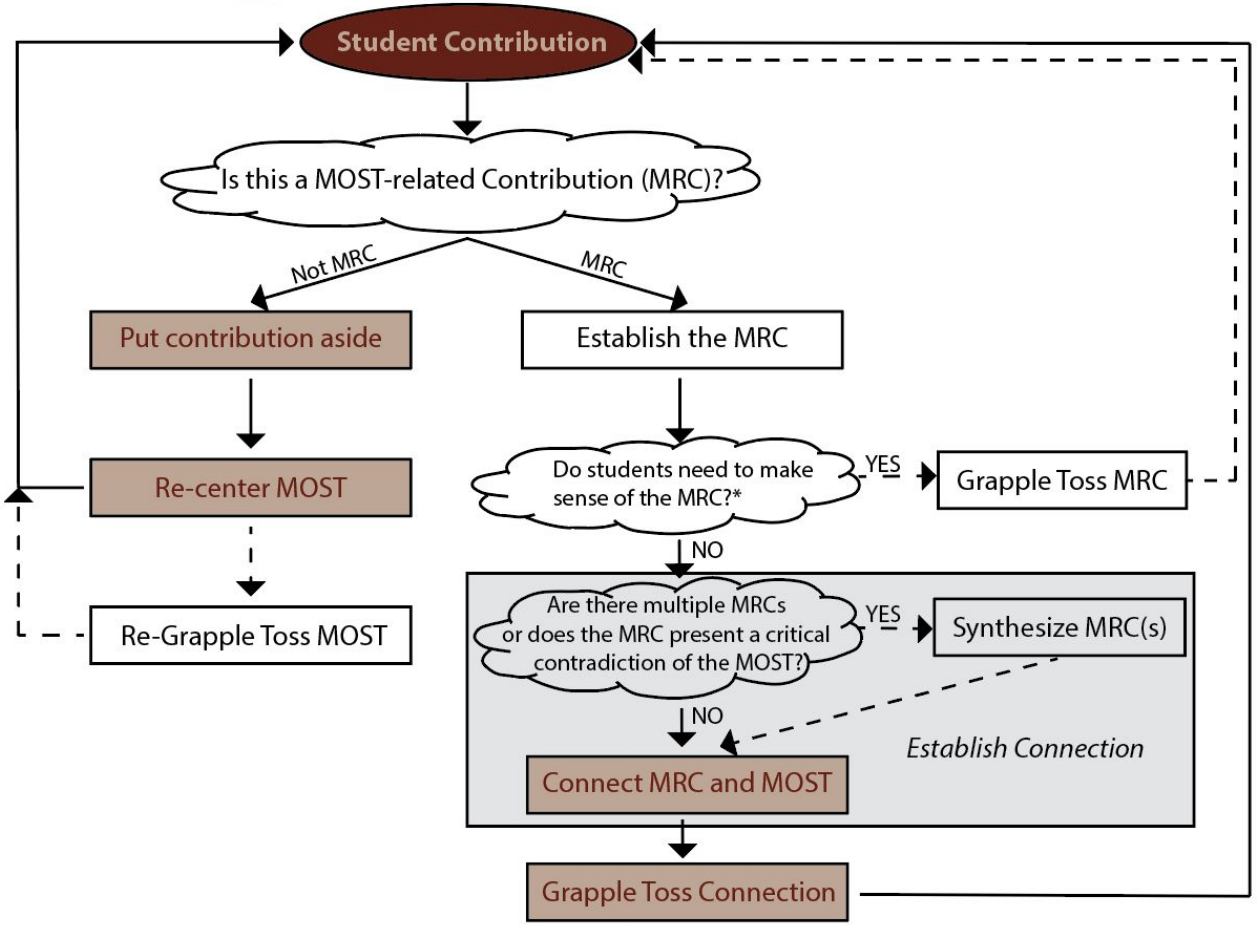
A **M**athematical **O**pportunity in **S**tudent **T**hinking (**MOST**) is a high-leverage student contribution made during whole-class interaction ("teachable moment")



Building engages the class in making sense of the MOST to better understand the mathematics of the MOST.

Conduct

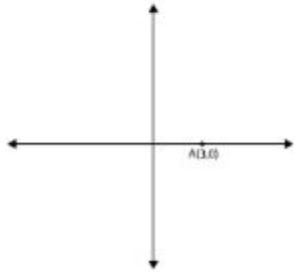
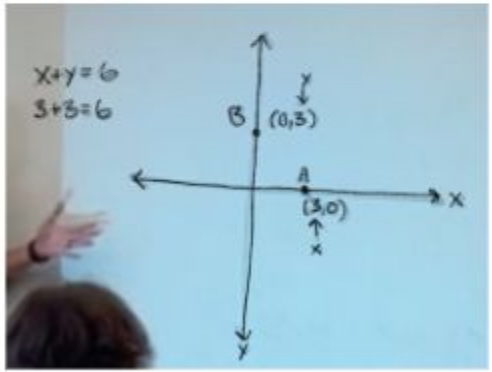
Goal: support the whole class to co-construct an argument that makes sense of the mathematics of the MOST



Noticing *With Respect To* (WRT)

- Initial Critical Event: A MOST
  - student contributions need to be noticed with respect to (WRT) whether they embody the characteristics of a MOST (Leatham et al., 2015)
- Once a MOST is recognized and the teacher decides to build on it, teachers' noticing needs to change
- While building, student contributions need to be noticed WRT:
  - the MOST that is being built upon
  - the arc of the argument that is being co-constructed as the class makes sense of the MOST

Example: Context

a. Points on a Line MOST Eliciting Prompt	b. Valarie's Contribution MOST	c. What can be learned Mathematical Point
Is it possible to select a point *B* on the y-axis so that the line $x + y = 6$ goes through both points *A* (3, 0) and *B*? Explain why or why not. 	"Yes. Point B is (0, 3) because you get 3 + 3 = 6" [x-value from A and y-value from B]. 	An ordered pair, (x, y), is a solution of an equation (and is therefore on the graph of that equation) if, when both x and y are substituted into the equation, the equation is true.

Example: Noticing WRT the MOST

Aaron: I did slope intercept form so I subtracted the x from the side of the y and I got y equals 6 minus x, the um the line for that was through (0, 6) on the y-axis and uh, and (6,0) on the x-axis.

Teacher: Okay, I'm gonna pause you because what you're starting to do right now is talk about what you did and I want to talk about this idea. [Gestures to public record.]

Example: Noticing WRT the Arc of the Co-Constructed Argument

Aaron: If you're looking at the coordinates on the graph aren't values of x and y and so replacing x and y with those 3's would be saying that the x and y are like values in an equation. But, what you want to do is take the x and y and use it as a line.

Yuri: Like you can't just pick different coordinates from whatever different points all around the graph. They have to be…from the same coordinate pair. You can't just pick from whatever point around the graph that you want.

Teacher: I'm gonna try to write that. Say that again, the two numbers [Begins to record Yuri's words on board.]

Take Aways

- Our work extends prior work on the initial noticing of critical events to the noticing that occurs in the follow-up to a teacher's initial noticing.
- The work highlights the importance of noticing with respect to something—what we call *noticing WRT*.
- Teachers are always noticing with respect to something; to move the field forward it seems important (for teachers and teacher educators) to be explicit about what that something is and when it how it might change during the course of instruction.

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Thank you!