

Paired Board Work is Not Bored Work!

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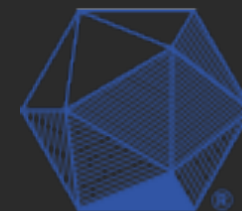
Maricopa Community College District (Arizona)

MAA MathFest 2018

Denver



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MAA IP Guide: Classroom Practices



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Instructional Practices Guide

Guide to Evidence-Based Instructional Practices in Undergraduate Mathematics

Download the [MAA Instructional Practices Guide](#) now.



Success in mathematics opens opportunities for students. A wealth of research literature exists on how mathematics instructors can facilitate rich, meaningful learning experiences and on what instructors can do to improve teaching and learning at the undergraduate level: **Effective teaching and deep learning require student engagement with content both inside and outside the classroom.** This Instructional Practices Guide aims to share effective, evidence-based practices instructors can use to facilitate meaningful learning for students of mathematics. Professional associations in the mathematical sciences along with state and national funding agencies are supporting efforts to radically transform the undergraduate

education experience; it is truly an exciting time to be a mathematics instructor!

MAA IP Guide: Classroom Practices

- Fostering Student Engagement
 - Building a Classroom Community
 - Collaborative Learning Strategies
 - Paired Board Work! (definitely NOT bored work)
- Selecting Appropriate Mathematical Tasks

Q: Who is doing the thinking in the classroom?

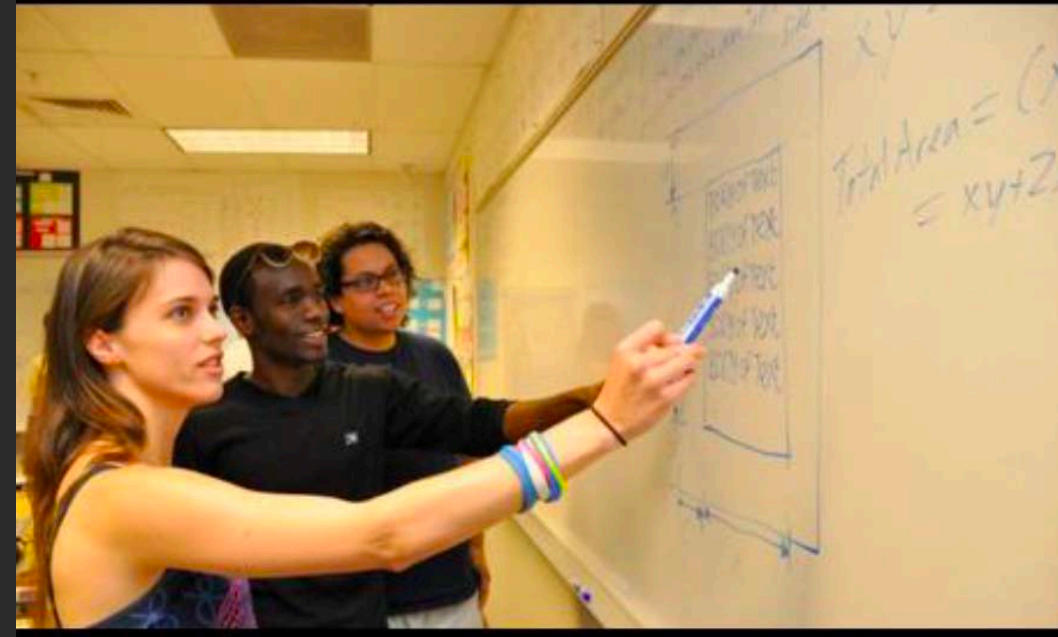
You?
or
Students?

Q: As teachers, do we “*cover* the material”?

Q: Or do we help students “*uncover* the material”?



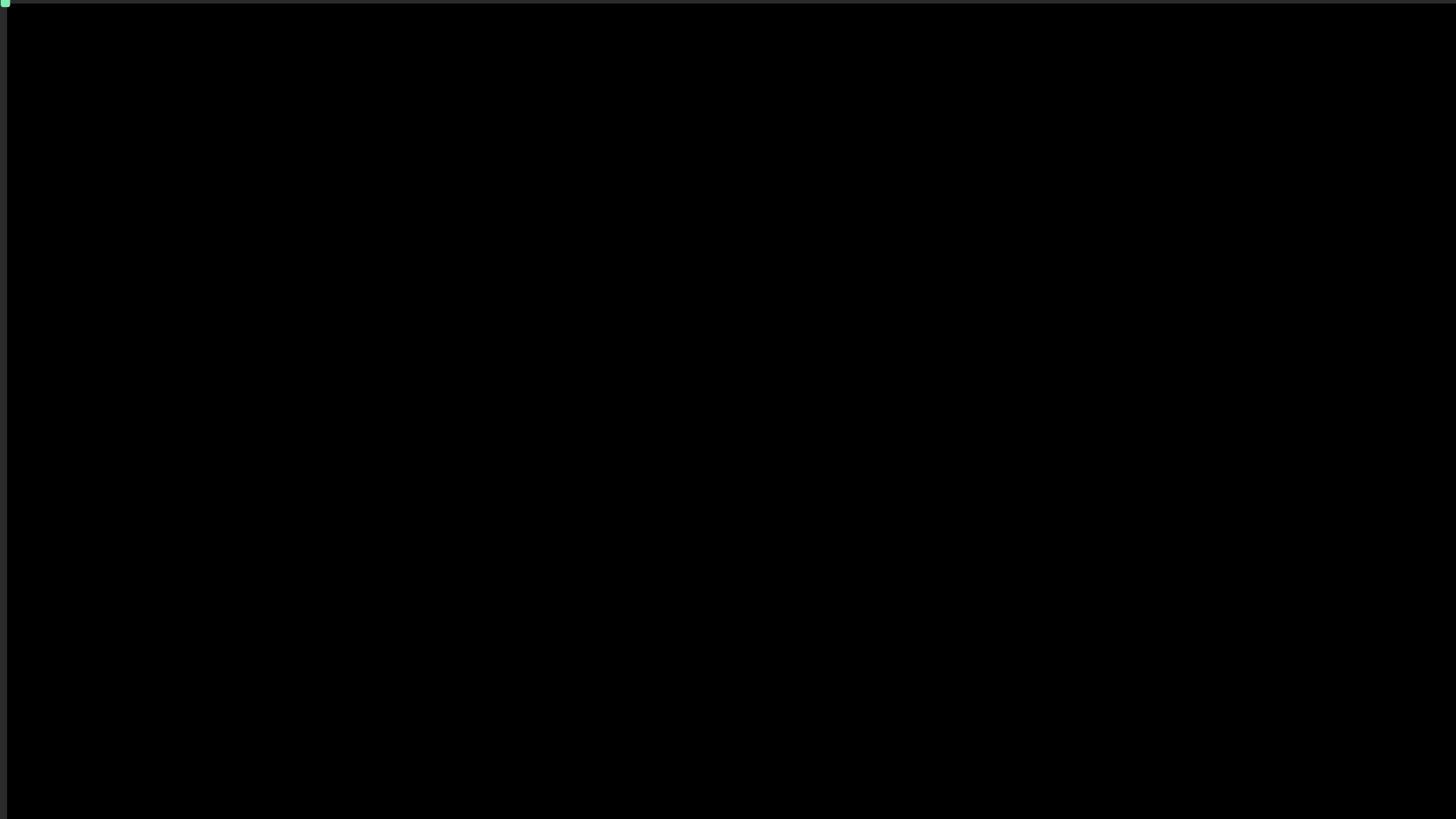
Active Learning Principles



Teaching methods and classroom norms that promote:

1. Students' deep engagement in mathematical thinking
2. Student-to-student interaction
3. Instructors' interest in and use of student thinking
4. Instructors' attention to equitable and inclusive practices

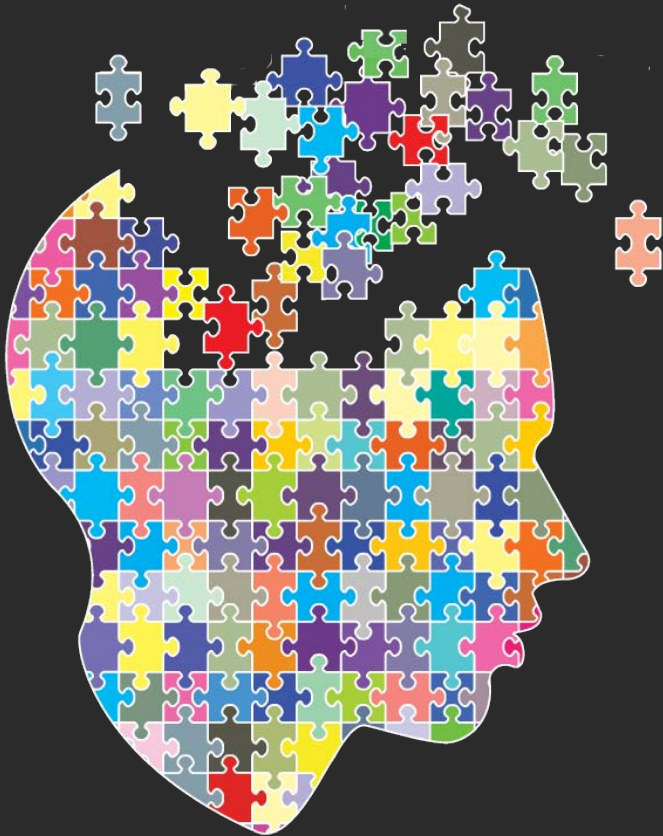
Who is doing the thinking?



Who is doing the thinking?



Fostering Student Engagement in Math

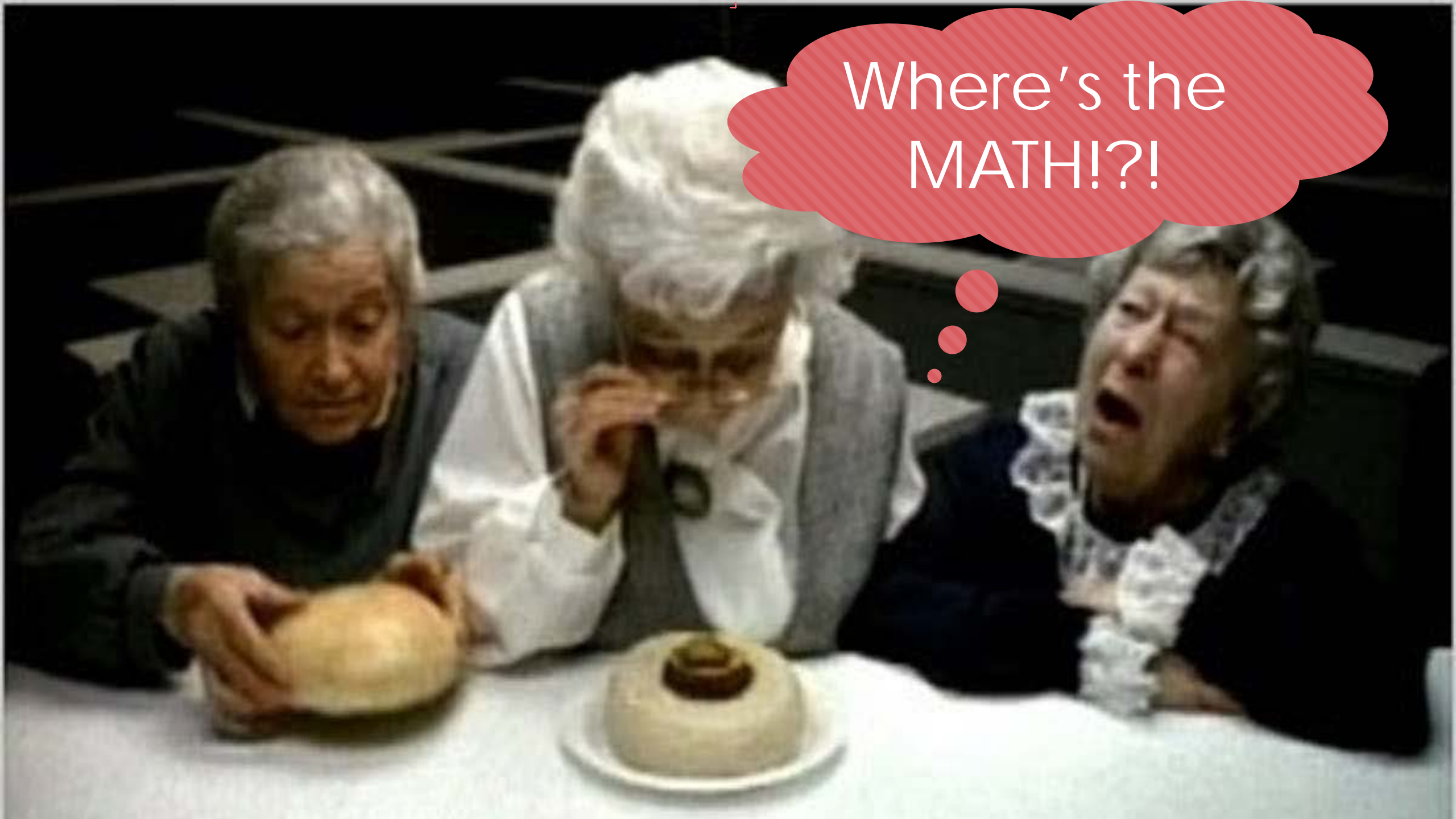


○ Active engagement

- Idea that learning occurs when students construct their own knowledge through social interactions.

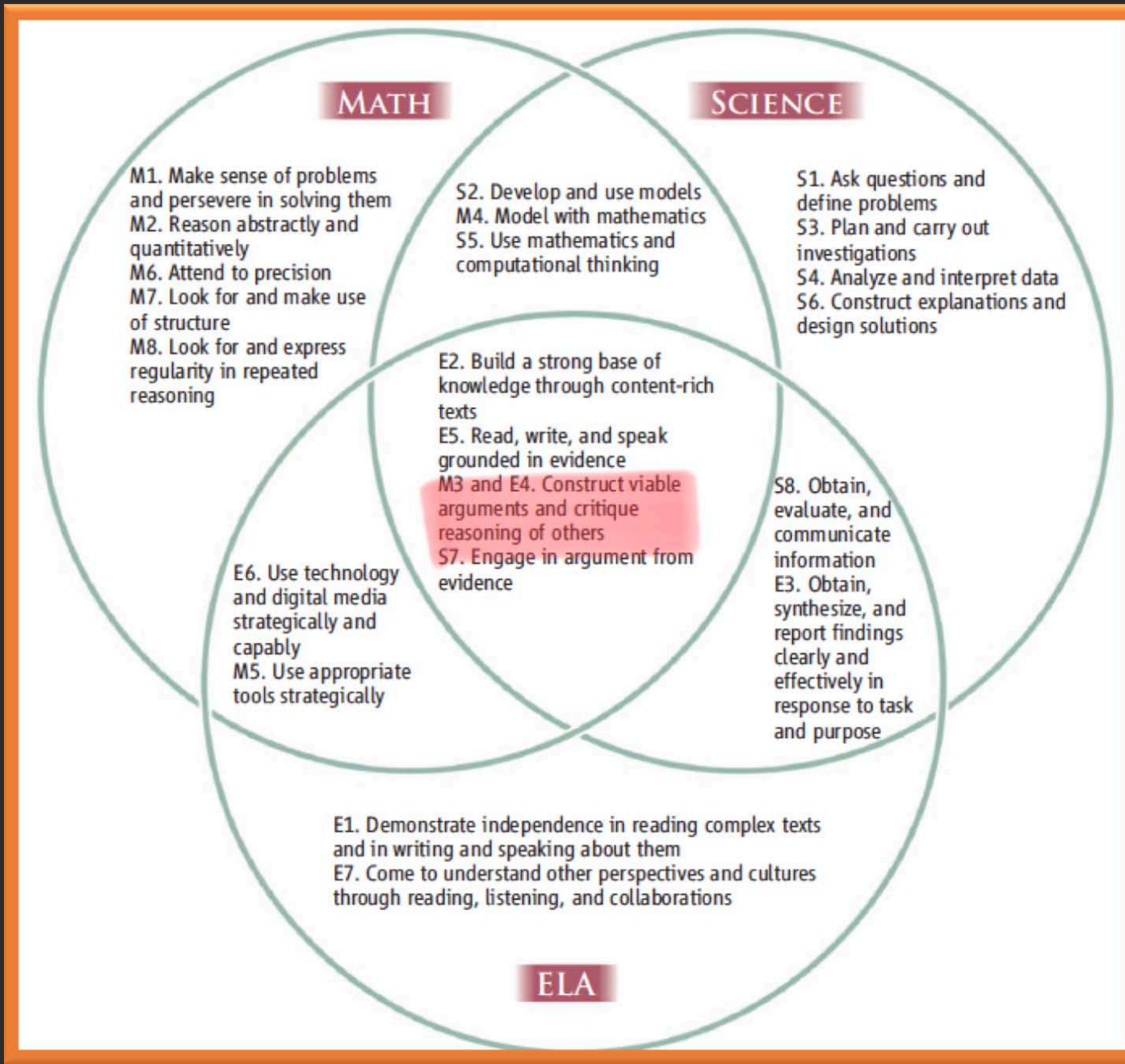
○ Cognitive engagement

- Idea that learning occurs when students are cognitively engaged in the mathematics.



Where's the
MATH!?!

CCSSMP + NGSS + CCSSELA



MAA IP Guide: Classroom Practices

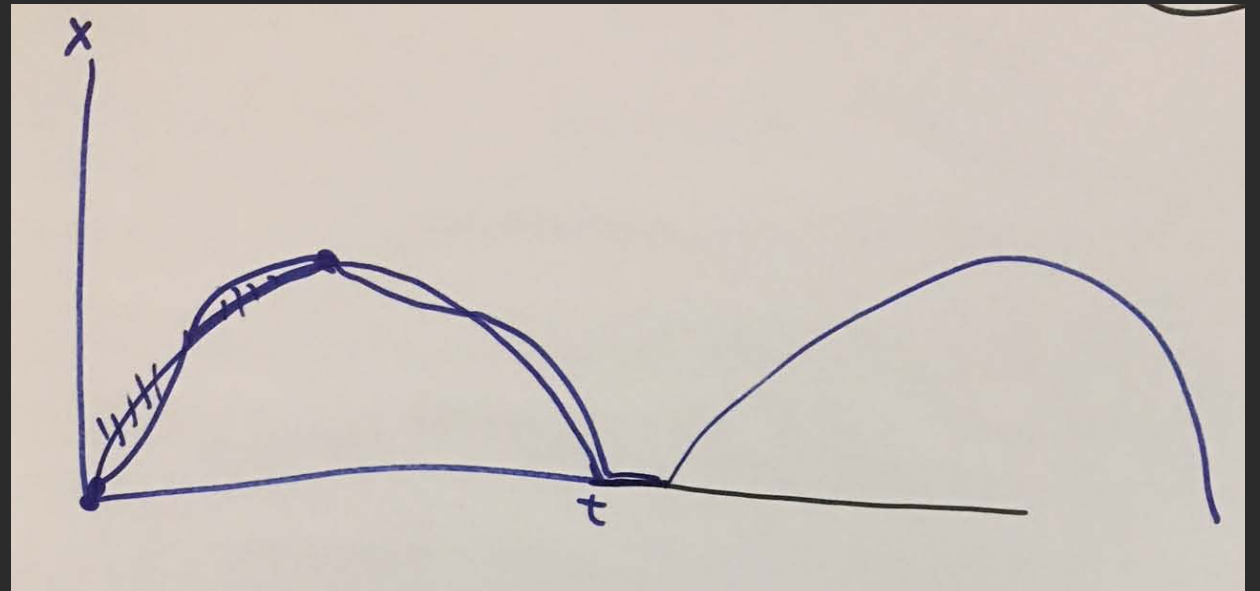
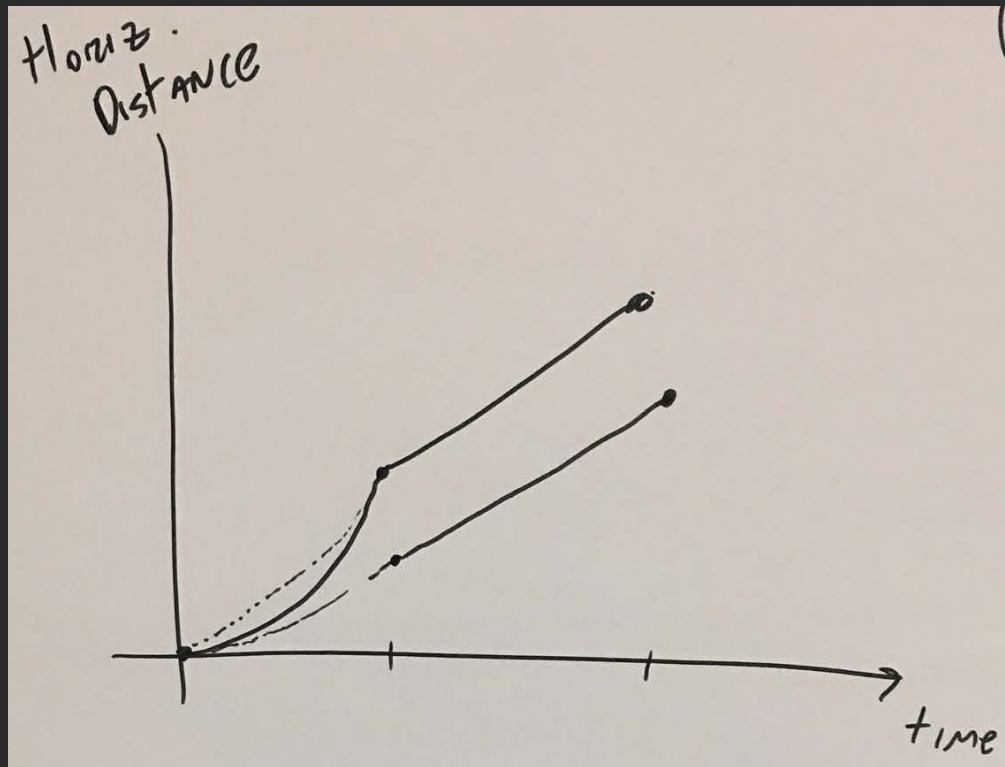
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The Skateboarder Problem

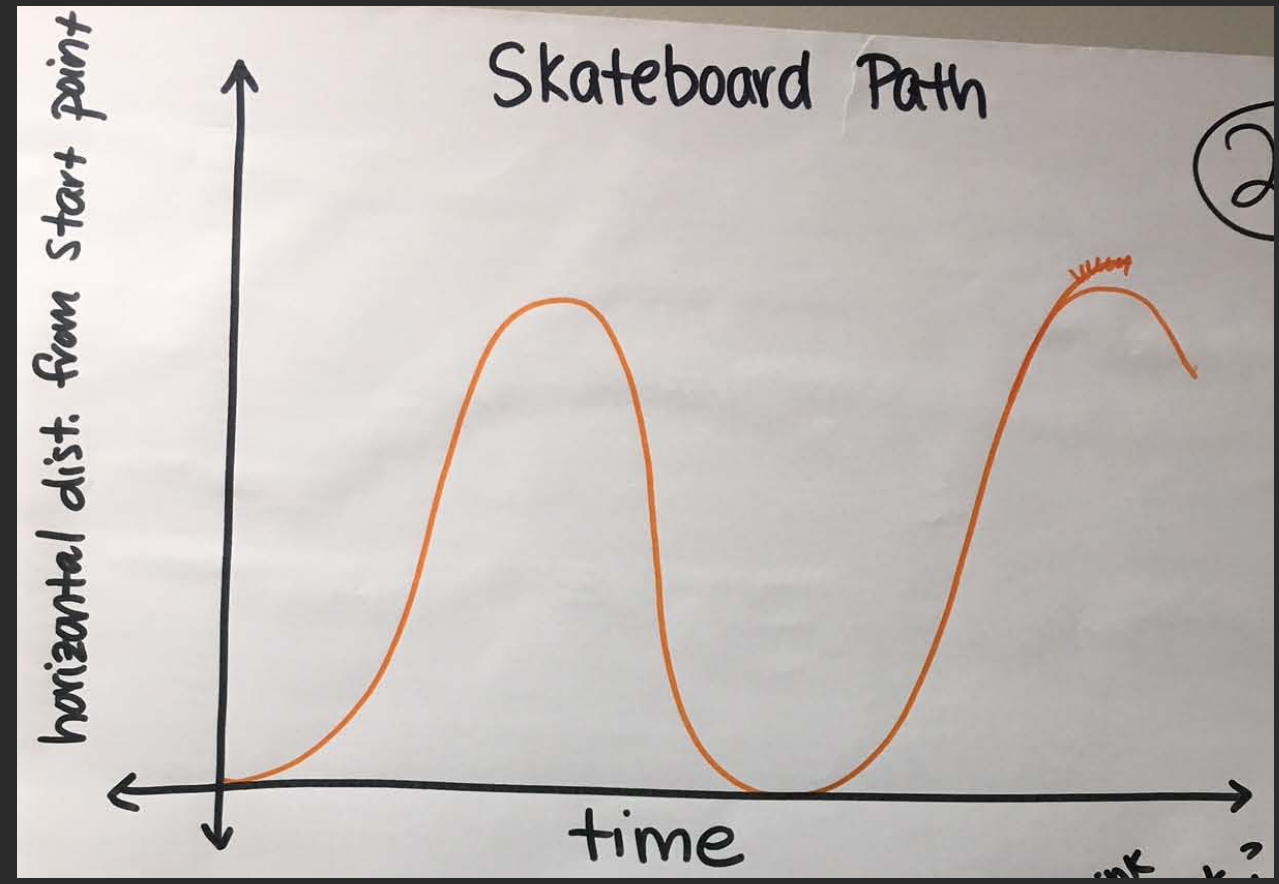
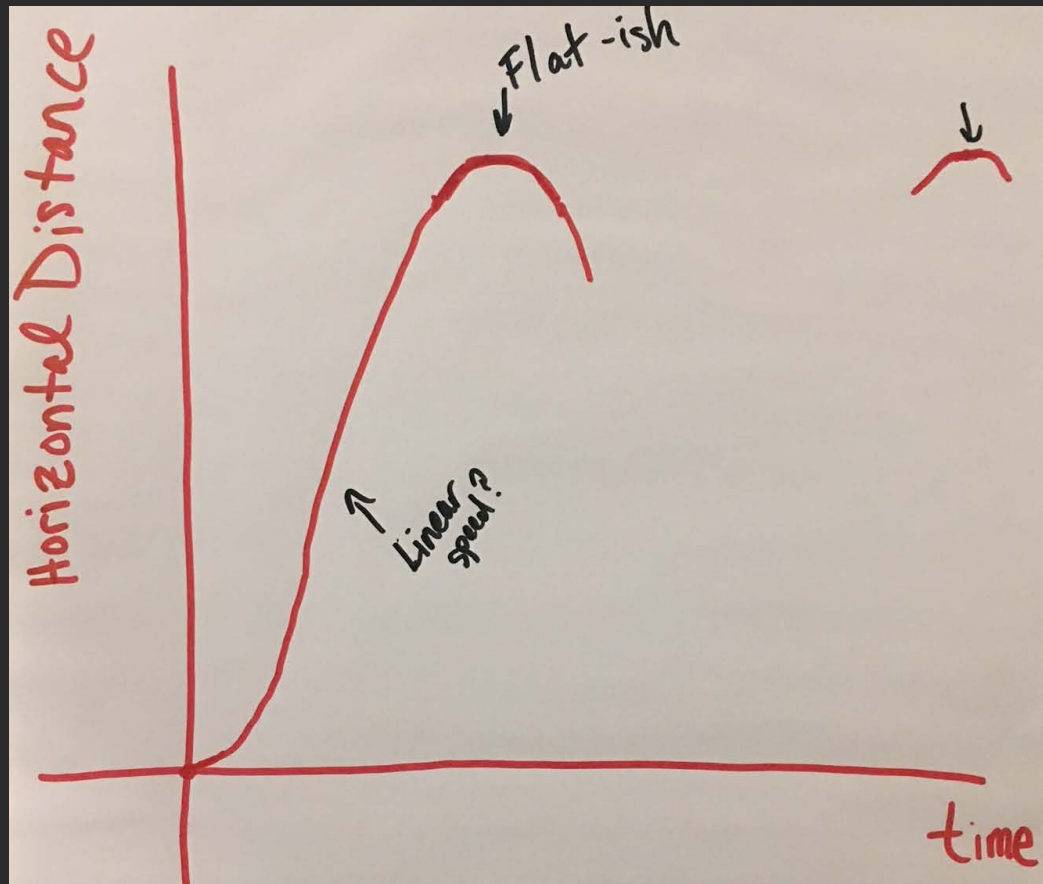
- Sketch a graph of the skateboarder's horizontal distance from his starting place (the left edge of the half-pipe) as a function of time since the video began.



The Skateboarder Problem



The Skateboarder Problem



Maximum Rectangle Task: A rectangle is to be inscribed within a right triangle with a base of 3 and a height of 4. What is the largest rectangle that can be created?

Benefits of Paired Board Work

- Makes student thinking public – written and verbal!
- Formative assessment of students' thinking and learning.
- Provides opportunities for students to develop precision of notation and language.



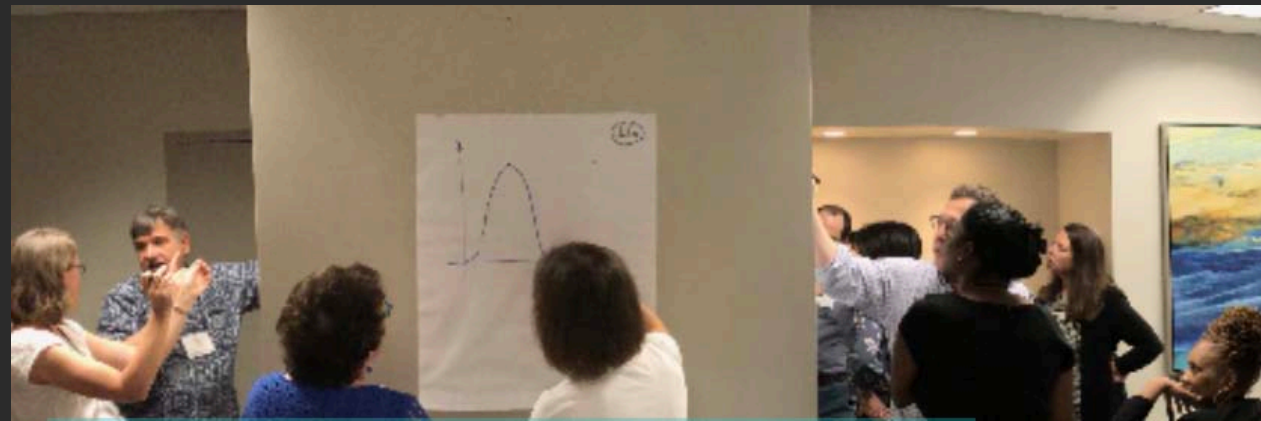
Advice for Implementing Paired Board Work

- Build classroom community...on Day 1
- Need whiteboard space or poster paper...and markers!
- Invest in a good pair of tennis shoes!



Advice for Implementing Paired Board Work

- Paired board work is about making students' thinking public – and for you, as the instructor, to use this thinking to guide instruction.
- Be prepared to be surprised, shocked, wowed, & amazed at what students CAN do!



Q: Who is doing the thinking in the classroom?

You?
or
Students?



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