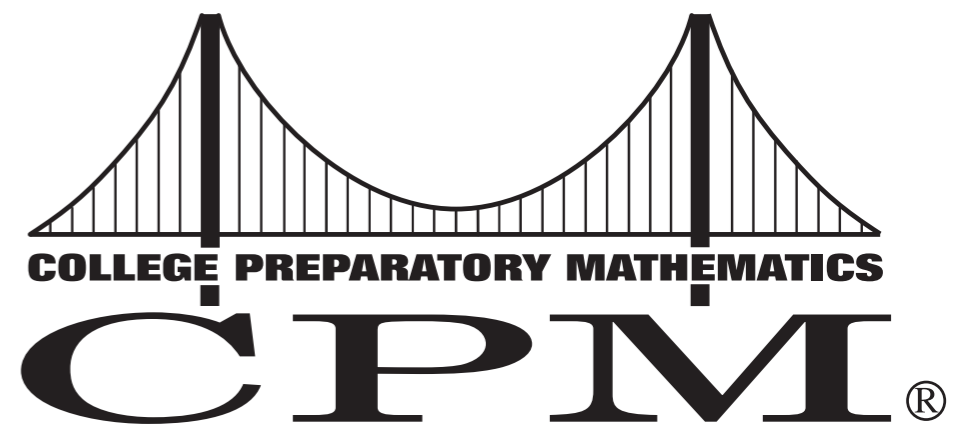


Algebra Connections

Why it is what it is

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CPM Conference 2008

Goals of Session

- To tell the story of the creation of Algebra Connections
- To help develop understanding of why it is designed the way it is.

DYAD

- Suppose you met someone who has taught CPM, but who has never seen or taught from Algebra Connections.
 - * What would you want to tell that person about AC?
 - * What would you not be able to tell that person about AC? In other words, what questions about could you not answer?

Challenges We Faced

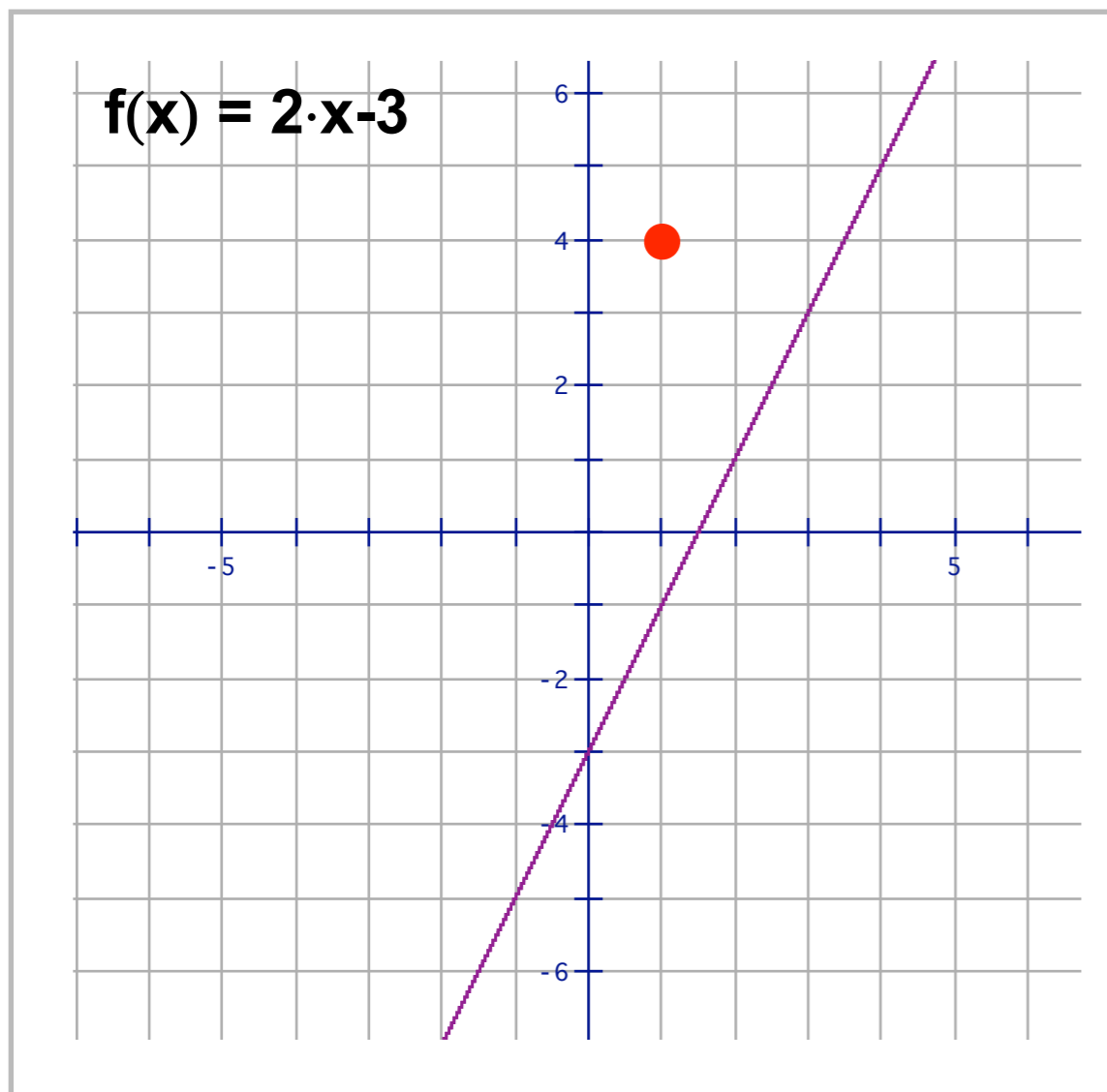
- At the beginning, the writers identified lots of challenges that existed with the previous courses that we wanted to solve.

Challenges We Faced

- ★ We knew of teachers who would skip the “big problems” - and those that would need to totally rewrite them.
- ★ Teachers reported high failure rates.
- ★ Managing groups continued to be teacher’s main challenge.
- ★ Took many years for teachers to gain enough insight to how to implement curriculum

Challenges We Faced

★ We identified common errors made by students.



$$4x + 3 - x$$

$$3x + 3$$

$$x = 1$$

$$4x + 3 = 4x + 3$$

$$\begin{array}{r} -4x \quad -4x \\ \hline \end{array}$$

$$3 = 3$$

No Solution

Core Beliefs

- **Mathematics is a coherent intellectual system, not a collection of disjointed facts, and needs to be taught in a way that makes this coherence clear.**
 - ▶ We viewed development of course as creating a “mathematical storyline.”
 - ▶ Strands were “braided” together so that connections emerge naturally.

Core Beliefs

- Curriculum works best when it is successful with both “traditionally struggling” and “accelerated” students.
 - ▶ The course is challenging and engaging for all students from the very beginning.
 - ▶ Builds conceptual foundation slowly with emphasis on manipulatives and looking at each problem multiple ways.

Core Beliefs

- Teachers teach better when curriculum materials are flexible and supportive.
 - ▶ Wrote extensive teacher notes for each lesson.
 - ▶ Developed “Further Guidance” section for large investigations.
 - ▶ Built in options for the teacher, such as options for chapter closure and Team Roles.
 - ▶ Provided suggested questions for teachers

Core Beliefs

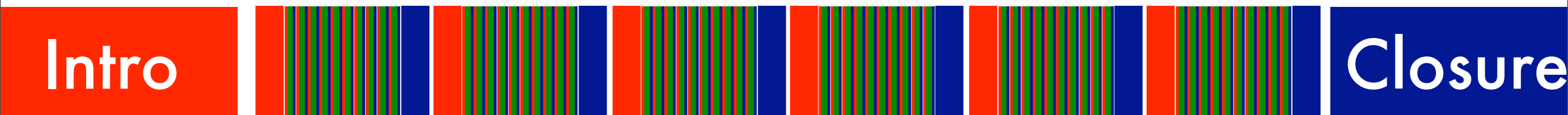
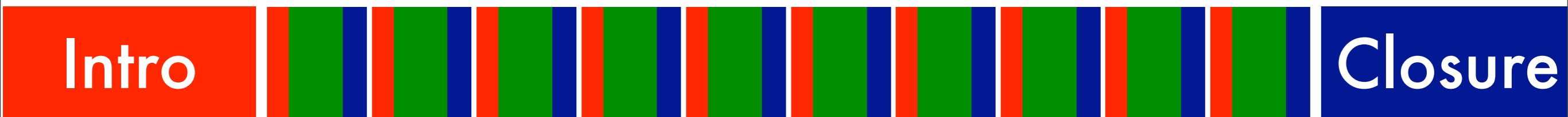
- **Investigations and lessons are more successful when students thoroughly understand what they are learning.**
 - ▶ Introduced “focus questions,” “target questions,” and “essential questions” to help students know the point of what they are learning.
 - ▶ Problems clearly describe the goal/ focus.
 - ▶ When possible, students are given a framework to understand & organize what they are learning.

Core Beliefs

- Teams work better when the work actually requires a team and there is something to talk about.
 - ▶ Team work needs to allow for multiple ways of solving and thinking to give teams rich source of discussion.
 - ▶ Problems need to be challenging to require students to discuss strategy, justify thinking, etc.

Core Beliefs

- How a lesson starts and how it ends is at least as important as the middle.



Core Beliefs

- Part of learning mathematics is learning how to talk, write, and think mathematics.
 - ▶ Ways of Thinking were developed
 - ▶ Learning Logs were introduced
 - ▶ Focus questions were provided for students to have “starter questions” to lead math conversations in teams (like “*How do we know this is always true?*”)

Core Beliefs

- **Teams work better when the work actually requires a team and there is something to talk about.**
 - ▶ Team work needs to allow for multiple ways of solving and thinking to give teams rich source of discussion.
 - ▶ Problems need to be challenging to require students to discuss strategy, justify thinking, etc.

Q & A

- What questions do you still have about Algebra Connections?
- General comments?
- Contact me at: dietiker@cpm.org