



# Supporting ELLs to Have Success with the CMP

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# Goals for session



- The goal of the session is to demonstrate the value ELLs derive from engaging in mathematical discourse to learn challenging mathematical ideas.
- After the introduction, I'll provide a brief review of relevant research literature. We'll then view some videos of my actual students solving math problems and have some discussions about what you see in these videos.
- Enjoy our time together and that this session will serve your learning goals!

# + Intro

- In 2007-08, I taught a 6<sup>th</sup> grade class using the Connected Mathematics Program 2 (CMP) in Albuquerque.
- I had 17 students in the class, 13 girls and 4 boys. At the time, all of the students would have qualified for Free Reduced Lunch.
- The class composition was highly diverse; 14 of the students were of Mexican descent and 12 were English language learners (ELLs). Two of the students are twin sisters and African-American.





# Immigrants in U.S.



- Over 50% of all immigrants in the U.S. are from a Latin American country; the majority are from Mexico.
- These immigrants are a heterogeneous group that challenges simple generalizations.
- The number of ELLs enrolled in schools in the U.S. increased 57% from 1995 to 2006 (NCELA, 2007).
- Mathematics teachers are struggling to understand and meet the needs of these students.



# Mathematics education for ELLs



- In schools that serve large numbers of immigrant Latino/a students, educators, peers and community members may assume students lack the capacity to perform well in mathematics (Moll & Ruiz, 2002; Téllez, Moschkovich, & Civil, 2011).
- “Deficit perspectives” such as these attribute lower levels of academic achievement to specific ethnic/racial groups based upon characteristics such as lack of fluency in English, or life experiences that do not parallel those of the dominant society, (Spielman, & Mistele, 2013).

# + Moving away from deficit perspectives

- Instead of looking at students and their communities through a deficit lens, students can be viewed as having funds of knowledge such as knowing one language and learning another, having experiences that are richly grounded in their culture, and having extensive mathematics experiences in their daily lives (Moll & Ruiz, 2002).



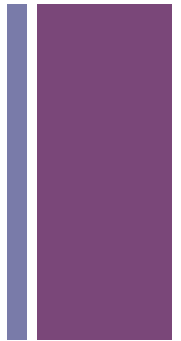
# + Mathematical discourse

- A prominent feature of the CCSSM is the value placed upon mathematical conversations or discourse.
- During mathematical discourse, the teacher seeks to foster and continually engage in dialogue with her students (Cazden, 2001; Herbel- Eisenmann & Cirillo, 2009).



## + Mathematical discourse 2

- When students have opportunities to engage in mathematical discourse to explain their ideas to peers and to listen to and make sense of the ideas of others, their learning is enhanced (e.g., Herbel-Eisenmann & Cirillo, 2009; Webb, 1991).
- I believe that listening to students' mathematical ideas and engaging them in discourse demonstrates we value the funds of knowledge they bring to the classroom.







# Engaging in discourse with ELLs through the CMP



- Let's get started by viewing some videos of my students doing some mathematics.
- One thing to keep in mind – students need to engage in solving problems that are accessible to them. Though these initial problems may not seem very advanced, they were representative of the types of problems included in the initial chapters of the sixth grade CMP text.

# + Marisol solves task #1

Veronica has  $5 \frac{1}{4}$  pounds of grapes. She gave  $2 \frac{2}{3}$  pounds to Marisol. How many pounds of grapes does Veronica have left?

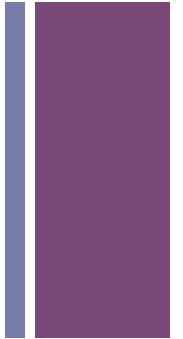
**Questions to be considered while watching the videos:**

1. What does the student know?
2. What do you notice about the mathematical discourse that takes place?



**What does the student appear to know?**

**What do you notice about the mathematical discourse that takes place?**



# + Andres solves task #2



Find  $1/6 - 2/3$

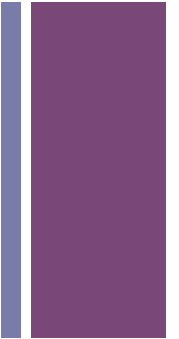
**Questions to be considered while watching the video:**

1. What does the student appear to know?
2. What function does discourse play in this vignette?



**What does the student appear to know?**

**What function does discourse play in this vignette?**





# Thinking about the students' mathematical thinking



- They used invented procedures and algorithms,
- Found and addressed their own errors,
- Students discovered what they did and did not understand well through discourse,
- They had the opportunity to express what they knew using multiple representations, and
- Students feel valued when you take their ideas seriously AND their ideas can inform instruction.



# A few observations about the CMP



- As a CMP teacher and trainer of teachers, I have come to think of the program as a rich feast that I want my students to enjoy daily. Students need time to savor the whole meal.
- This is particularly important for students who have had limited opportunities to engage in a challenging standards-based mathematics education (Kitchen, et al., 2007).
- Rather than viewing students as deficit because they are behind in mathematics (Kitchen, et al., 2007), students need to be provided supplemental academic support so that they can both get up to grade level and move forward to learn challenging mathematical content comprised in the CMP.



# Students need time and support to learn mathematics



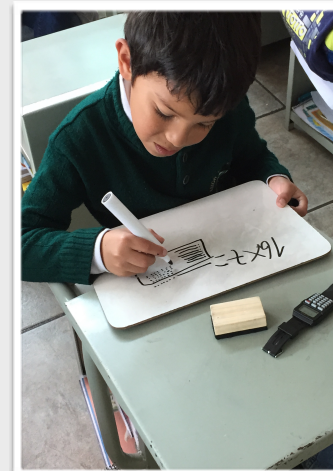
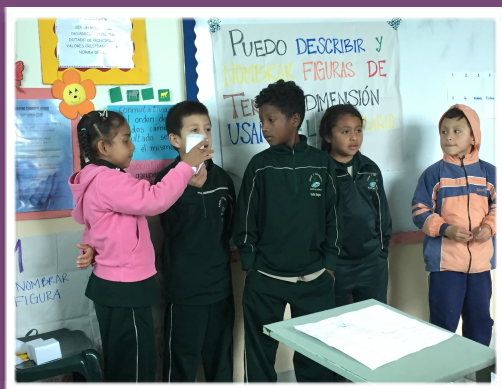
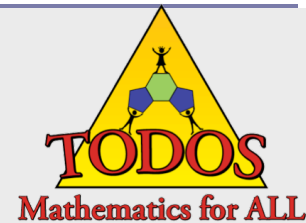
- The CMP is a mathematically rich program and time is needed to engage students in the extended investigations that are part of the curriculum.
- At the school where I taught the 6<sup>th</sup> grade CMP class, students regularly worked on mathematics for more than an hour and up to two and a half hours daily.
- The extended class periods and tutorial support were essential, especially if students were going to learn mathematics with understanding at the high levels demanded by the CMP.





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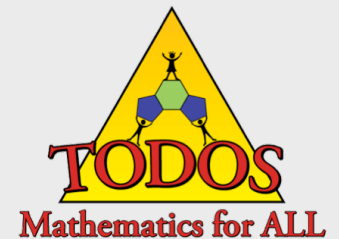
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