



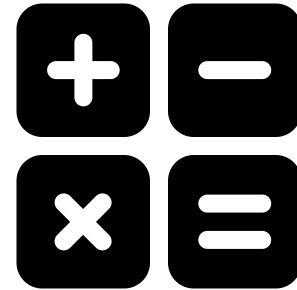
## Singapore Math with Dawn Swartz

### Lesson 2: What is Number Sense and Math Talk?

#### Outline:

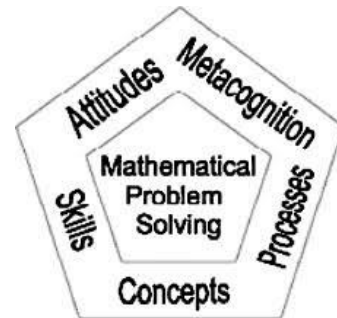
##### Introduction

- Definition of Number Sense: Fluidity and flexibility with numbers. Can students look at numbers in various ways and with comfort? Can they related numbers to one another and related numbers to the real world?
- Most students need help to learn how to think about numbers
- This session: How to talk about numbers or “math talk”



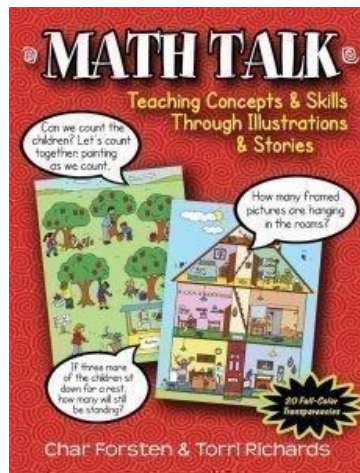
What it means to talk about math and how it fits in with strategies for teaching and learning math.

- In this session, Dawn will address how to help students to talk about math from K through the fifth grade.
- Even in K, students need to learn how to talk about numbers
- Use CAP for helping students talk about math: **Concrete to Pictorial to Abstract**
- Start with a concrete example.
- Example: K students brought rectangular solids to class: blocks, Legos, tissue boxes. This led to a lot of talk about them!
- **Vocabulary of math** and the language of comparison
- Teaching the difference between part and whole
- Help students to think out loud about math. Helps students to learn how to count in various ways.
- Students need to learn not just that math works but why it works
- **Concrete Stage:** Demonstration using puppies for concrete thinking and comparison thinking. What do you notice that is the same about these puppies? What is different about their ears or nose?
- **The Pictorial Stage:** Big storybook. Demonstration using a large storybook (Goldilocks) including math talk questions about parts and wholes, comparison, computation and building vocabulary... “How many grown-up bears do you see?” (part-whole question).”How many bears are children?” How many bears as a whole, in the family? Comparative questions: “Who





- has the most porridge in the bowl?” “Tell me about Papa Bear’s hat?” “Who has the largest bowl?” Computation question: “How many bowls of porridge are empty?” Questions of counting: “How many bears are in the story?” “How many eyes does each bear have?” “How many eyes altogether?” Perhaps count by two. Demonstration from Jack and Jill book: Jack and Jill fetched ten pails of water. “How many blue pails are there?” “How many orange pails?” “How many altogether?” “What shape do they make?”
- **Website resource:** For helping parents to talk about math with their children at home: See [www.bedtimemath.org](http://www.bedtimemath.org). For use by parents rather than teachers. Can load as an app or a daily email. Make math part of the daily routine. Helping kids see math in their favorite topics, only five minutes per day. Questions for children of various ages.
  - Other resources: [Math Talk](#) (a book) by Char Forsten and Torri Richards.



- **Talking about math in Grades 3-5:** Conversation about math doesn’t stop but extends
- **Resource Ideas** using the pictorial way of talking about math: Photographs that you print off the web, or from magazines; project using a document camera as a warm-up activity. Create questions relating to the photos and engage in “math talk.” Questions of symmetry and pattern. Photos of building that feature angles (acute, right angles, obtuse angles, etc.). Photo of arrays of tea or other items. Good for studying arrays, geometric measurements. Christmas tree with packages: geometric solids. Have students write their own word problem with a bar model in association with the photo.
- **Use books from the reading curriculum.** Example: 3rd-grade book, *Escape from Pompeii*. Illustrations with geometry, shapes, parallel lines. It is OK to occasionally pause when reading the story to point out mathematics in such a book. “How many clay tiles was necessary to make this tiled roof?” “Some are hidden behind the column...”
- **Conclusion:** Students need to think and talk about numbers. Give opportunities to talk about math using the concrete, the pictorial, and to



- develop their mathematical vocabulary. Consider demonstrating for parents during a back to school night how parents can talk to children about math. Integrate math using other content areas. Gradually, it will become a natural way you teach.
- In the next session, Dawn will present on number bonds so please print out the number bonds PDF to consult during this next presentation.

## The SM Mathematical Framework: A Mathematical Problem-Solving Framework

