



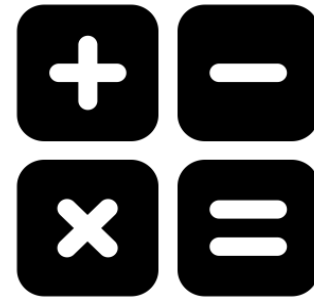
Singapore Math with Dawn Swartz

Lesson 1: Introduction to Singapore Math

Outline:

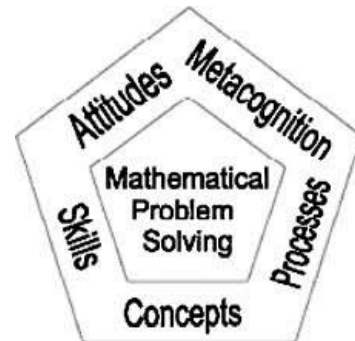
Introduction

- Singapore Math fits well within the context of classical education
- It is important to make a good transition to Singapore Math (SM) by preparing well
- This course is designed for you whether you are brand new to SM or have been teaching it for a while.
- The favorite part of Dawn's day: teaching Singapore Math!



What is Singapore Math and why teach it? Background of Singapore Math and Overview

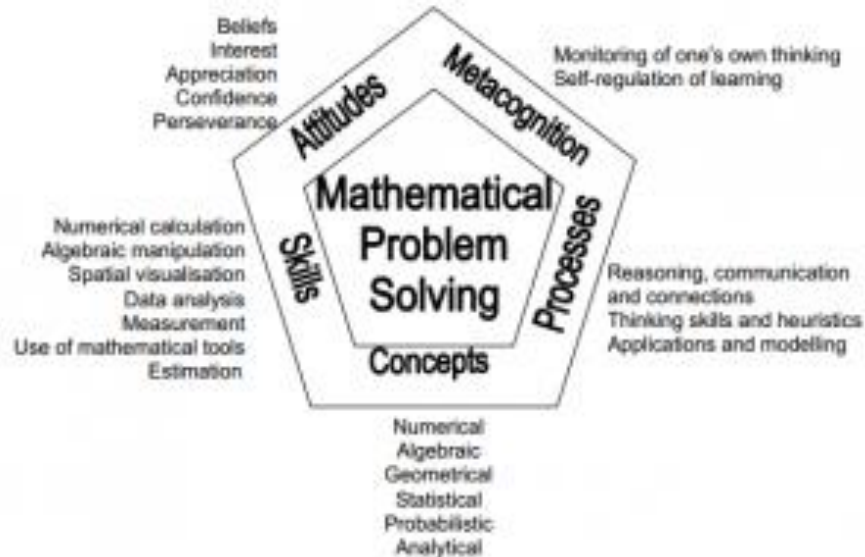
- In 1965 Singapore become independent. In the 1980s the Ministry of Education started the primary mathematics project. Combined effective teacher strategies with teacher training and development.
- Team was started to address students who struggled with mathematics word problems; created the math model approach
- In the 1990s it was noted that Singapore students were scoring in the highest tier in the international TIMSS test ([Trends in International Mathematics and Science](#)) for fourth and eighth graders. 2015: students were at the very top.
- Questions people began to ask: How do we get students to master math the way students in Singapore are?
- This course will present the distinctive aspects of Singapore Math and strategies for teaching it
- Amount of topics per year in SM is only 10-15 rather than the conventional 30 topics.
- Each topic in SM should be taught to mastery.
- It is important for each teacher to know what mathematics was taught in the previous grade.
- Basic pedagogical movement in Singapore Math is from CONCRETE to PICTORIAL to ABSTRACT.
- Concepts taught first with manipulatives and movement. If we move to fast to the abstract we sacrifice conceptual understanding for procedural proficiency.





Example; It important to teach place value concretely in preparation for teaching long division.

THE SM MATHEMATICAL FRAMEWORK: A Mathematical Problem-Solving Framework



- Review this mathematical framework throughout the course and let it guide you through your study and teaching of SM

Five Essential Elements of Mathematical Problem Solving in SM:

- **Concepts:** Varied learning experiences teach understanding of concepts (concrete-pictorial-abstract)
- **Skills:** Concepts developed through skills; skills as procedures that are part of conceptual understanding.
- **Attitudes:** These are shaped and influenced by learning experiences. The story of James: James tells Dawn “I don’t like math.” Dawn takes this as a challenge...after several months his attitude about math changed and improved until he liked math. Approach students with a growth mindset.
- **Metacognition:** How to think about thinking?
- **Process:** How to construct arguments to get to the answer. Heuristics: ways of approaching a problem when the solution is not obvious—experienced-based techniques for learning and discovery. Examples: make a representation, diagram, or list for the material; calculated guess (guess and check); act out the problem or story; change the problem altogether.

How does this fit a classical model of education?

- Language-based program
- Filled with constant guided and purposeful questions; How? Why? Different strategy possible? Explain your strategy; constant conversation.



- It keeps problem-solving central to mathematical learning
- It teaches thinking skills and heuristics
- One piece missing: the beauty and order of math that is inherent because of our Creator. This should come out in your math lessons.
- Scott Buchanan quotation: “The structures with which mathematics deal are more like lace, the leaves of trees and the play of the light and the shadow on a human face than they are like buildings and machines, the least of their representatives.”
- Teaching SM will help us develop lifelong learners...of mathematics.

What's coming?

- The rest of the course session will address the questions each math teacher will have: What do I do and why?
- Coming sessions will follow these topics (in order): Number sense, place value, and model drawing
- Dawn encourages each teacher-learner to create and use a three-ring binder.
- Be ready to “work along” with Dawn during the rest of the course
- Print out the accompanying sheets (see the downloadable PDF) to put in your binder and work along with Dawn.