Parent Information Night

Primary Mathematics Series

Standards Edition

Singapore Math

August, 2009

Gary Zellner, Dir. of Elem. Ed. & Administrative Services

Dr. Collene Van Noord, Asst. Supt. of Curriculum & Instruction

Char Forsten, Singapore Math Trainer

Essential Questions

- Why is Palmyra changing the math series?
- What are some of the latest recommendations for improving math instruction?
- What are the reasons why Palmyra selected a program that originated from Singapore?
- What are components of the Primary Mathematics Program?
- What are some ways parents can support the new program?

Reason for Change in Series

- Previous series was 13 years old.
- Series was out of print.
- Previous series does not reflect the current research on effective math instruction.

RESEARCH

- A National Mathematics Advisory Panel (NMAP) report was made in late 2007. The following are some of the panel's main findings and recommendations that apply directly to K-6 mathematics instruction.

- Singapore Math meets the NMAP's recommendations.

National Mathematics Advisory Panel

- Children need to study math:
  - adequate depth
  - going from easy to hard
  - master concepts so …
  - … concepts not re-taught every year.

- Must build the foundation needed for algebraic thinking. Includes:
  - conceptual understanding
  - computational proficiency
  - problem-solving skills.

National Mathematics Advisory Panel

- Computational proficiency with whole numbers means:
  - automatic recall of number facts
  - fluency with standard algorithms of the 4 operations
  - understanding of the commutative, distributive, and associative properties.

- Need to link "effort" to "being smarter" with children. Need to educate the public that math ability wasn't inherited from your parents.

PARADIGM SHIFT

- Asking teachers to develop students' algebraic thinking represents a paradigm shift in the teaching of mathematics.
  - FROM, math curricula have emphasized arithmetic (calculation) in elementary school and algebra in middle school. This sequence makes the transition from arithmetic to algebra difficult for many students because it requires them to make various adjustments. For example, when students study algebra, they no longer focus merely on calculating numerical answers but on understanding and representing relationships through the use of letters and numbers.

- TO new paradigm is evolving in math education – one that calls for teachers at all grade levels to help students develop "habits of mind that attend to the deeper underlying structure of mathematics."

TRENDS IN INTERNATIONAL MATHEMATICS & SCIENCE STUDY

TIMSS Report 2003 4th grade National Scores

#1	**Singapore**	**594**
#2	Hong Kong	575
#3	Japan	565
#4	Chinese Taipei	564
#5	Belgium	551
#6	Netherlands	540
#7	Latvia	536
$8	Lithuania	534
#9	Russian Federations	532
#10	England	531
#11	Hungary	529
#12	**United States**	**518**

SINGAPORE MATH

- Language-based math
  - make connections between **pictures**, **words**, and **numbers**

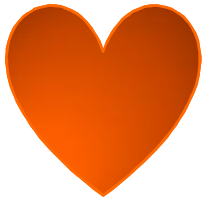
- The curriculum is highly coherent;
  - **logical, step-by-step** manner
  - builds on students' **prior knowledge** and **skills**
  - **concrete** to **pictorial** to **abstract** approach

- Cumulative program
  - **revisits** concepts covered earlier by **connecting** strands of mathematics

Singapore Math

- Topic intensive
  - Fewer topics per grade
- Small textbooks
  - Skills not re-taught formally
- Mental-math strategies embedded throughout
- Accelerated program
  - Drives all ability levels to learn and grow
- Highly visual program
  - Benefits special-needs students and inclusion students

- **Problem solving** is the heart of the Singapore Math.



  - **Place value**
  - **Mental math**
  - **Computation** are reinforced through problem solving, particularly through the **model drawing** approach.

- Singapore's Primary Mathematics education culture is reflective and based on students developing the following core understandings:
  - Number Facts
  - Number Sense
  - Patterns
  - Visualization
  - Communication

Typical Class Structure

- Contains 5 distinct segments:
  - Mental math – 10 min.
  - Teacher-directed lesson – 20 min.
  - Activity – 20 min.
  - Problem-solving – 15 min.
  - Independent practice – 15 min.
    - * Times vary somewhat by grade and developmental level

What Can Parents Do?

- Attend parent meetings. (There will be more.)
- Ask children to explain math they bring home.
- Look for patterns around you. Predict what comes next?
- Look for math in the world around you.
- Practice flash cards.
- Play math games.
- Try model drawing.
- Attend Open House and Parent-Teacher Conferences: Ask questions.
- Encourage children to develop and tell math stories.

Websites

1. Crystal Springs Books ~ www.crystalsprings.com
2. Singapore Math ~ www.singaporemath.com
3. Staff Development For Educators ~ www.sde.com
4. Teacher / Training Tools ~ www.trainer-tools.com
5. National Council of Teachers of Mathematics ~ www.nctm.org
6. Creative Publications ~ www.creativepublications.com
7. Thinking Blocks ~ www.thinkingblocks.com
8. Box Cars & One-Eyed Jacks ~ www.boxcarsandoneeyedjacks.com
9. Great Source (*Math in Focus*) ~ www.greatsource.com
10. Online Math Fact Practice ~ www.haelmedia.com/basic_fact_sheets/index.html

ARTICLES & STUDIES

1. American Institutes for Research. (Ginsburg, Leinwand, Anstrom, & Pollock) (January 28, 2005) "*What the United States Can Learn From Singapore's World-Class Mathematics System (and what Singapore can learn from the Untied States): An Exploratory Study*." Washington, DC: US Department of Education Policy & Program Studies. (www.air.org/news/documents/singapore.htm)
2. Hof, David. "US, Singapore Agree to Cooperate on Math and Science," *Education Week*. September 18, 2002.
3. National Center for Education Statistics, US Department of Education. (2003) *The Trends in International Mathematics and Science Study* (formerly The *Third International Mathematics and Science Study) (TIMSS)*, Washington, DC; US Government Printing Office. (http://isc.bc.edu.timss.2003.html)
4. Quek, Tracy. "Now, Israel Uses S'pore Math Textbooks Too," *The Straits Times*. Singapore, September 23, 2002.
5. "Singapore Number One in Mathematics Again and Rose to Number Two in Science in the Third International Mathematics and Science Study (TIMSS) 1999," Source: Singapore Education Ministry, November 28, 2000.
6. Strauss, Valerie. "Looking East for Math Techniques," *Washington Post*. March 21, 2000.