

Where **CONTENT** meets **PEDAGOGY**

Singapore Mathematics Summer Institute

July 6-8, 2011

Worcester State University, Massachusetts

The inaugural Singapore Mathematics Summer Institute
jointly conducted by Marshall Cavendish Institute
and Worcester State University.

Marshall Cavendish Institute

Professional Development.Publications.Research.People



Why You Should Attend

A First in the U.S.

Bringing content and pedagogy together, this summer institute will delve into the instructional strategies integral in Singapore Mathematics. For the first time in the U.S., attend an institute that has the combined expertise of mathematicians, mathematics educators and practitioners from the U.S. and Singapore. The presenters have either an intimate knowledge of Singapore education, or an understanding of the kind of content elementary teachers need to deliver a strong mathematics program.

An Institute for All

The program has been designed to cater to participants with varied experiences in teaching Singapore Math. It is designed for deep professional learning by using a variety of teaching methodologies including the use of authentic students' responses and video case studies. You will gain new perspectives on fundamental topics such as whole numbers and fractions, as well as elective topics. You will develop a deep understanding of content and enhance your pedagogical content knowledge. Learn effective ways of developing your students' ability to think mathematically, to problem solve and to transform their attitudes about Mathematics.

In this Singapore Mathematics Summer Institute, you will

- Learn firsthand from Mathematics and education professors and from Singapore-based educators who have extensive experience teaching mathematics in Singapore.
- See Singapore Mathematics in action and learn about the proven strategies for effective Mathematics teaching.
- Get authentic learning experiences by participating in different types of learning sessions.
- Improve your classroom practice with ideas you will learn from the many interactive sessions and plenary lectures.
- Deepen your mathematical understanding

Who Should Attend

- Grades K-6 Classroom Teachers
- Principals
- Lead Teachers
- Math Coaches
- Math Curriculum Specialists and Directors

Fees & Specials

Fees: 3 days – US\$750

Group Discounts!

Groups of 5 or more will be entitled to an additional 5% discount.

Please note that fees include lunch but do not include accommodation.

Program

6 JULY 2011	SESSION
8.00 – 8.30 am	Registration
8.30 – 10.30 am	PLENARY SESSION 1
	<p><i>Pedagogical Strand: Fundamentals of Singapore Math</i></p> <p><i>Content Strand: Counting and Place Value</i></p>
<p>By the end of the first plenary session, you will have an overview of the theoretical underpinnings of Singapore Math and an understanding of the fundamental concepts for whole numbers. The classroom sessions will provide a deeper understanding of the teaching of whole numbers with special emphasis on addition and subtraction.</p>	
<p>11.00 – 12.30 pm</p> <p>Choose either session.</p>	CLASSROOM SESSIONS 1
	<p>A1 Whole Numbers Addition & Subtraction – Grades K to 4</p> <p>We will learn about number bonds and its role in helping students develop number facts. We will also learn different strategies to develop number facts and how addition and subtraction algorithms are taught such that procedures are well-supported by concurrent development of conceptual understanding. We will also learn alternate strategies to add and subtract larger whole numbers. The emphasis in this session will be on conceptual understanding and the development of number sense.</p> <p>A2 Whole Numbers Addition & Subtraction – Drill & Practice and Problem Solving Can Happen Simultaneously</p> <p>This session is not grade level specific. We will learn that drill-and-practice and higher-order thinking are not mutually exclusive. We will be doing some activities that provide opportunities for consolidation of the skills of adding and subtracting whole numbers and for problem solving simultaneously.</p>
12.30 – 2.00 pm	Lunch
<p>The afternoon sessions progress to include the multiplicative fields, that is, the teaching of multiplication and division involving whole numbers.</p>	
<p>2.00 – 3.30 pm</p> <p>Choose either session.</p>	CLASSROOM SESSIONS 2
	<p>A3 Whole Number Multiplication & Division</p> <p>We will learn the different meanings of multiplication and division and see how each meaning is introduced progressively through the different grade levels. We will see how dot diagrams are used to help students learn and make sense of multiplication facts and learn how the CPA Approach is used to help students learn the multiplication and long division algorithms meaningfully.</p> <p>R4 Learn Some Math with Dr. Richard Bisk – Algorithm Development</p> <p>Deepen your content knowledge related to the teaching of algorithms. We will learn how algorithms are developed in a way that learning is conceptual. We will also discuss the implications for the classroom.</p>

7 JULY 2011	SESSION
8.30 – 10.30 am	PLENARY SESSION 2
	<p><i>Pedagogical Strand: The CPA Approach in Mathematics Learning</i></p> <p><i>Content Strand: The Four Basic Operations</i></p>
<p>The plenary sessions aim to consolidate the learning from the classroom sessions. One of the theoretical underpinnings of Singapore Math – the CPA Approach – will be given a detailed treatment by Dr. Yeap. You have seen that the CPA Approach can be used to teach multiplication and division of whole numbers. Now, see the CPA Approach in the teaching of other topics. Dr. Bisk will help us consolidate and synthesize our learning about the four basic operations on whole numbers.</p> <p>We are now ready to delve into the use of bar models in Singapore Math. The sessions will help participants learn the use of bar models to help students consolidate their understanding of the four basic operations. Word problems involving whole numbers will be used in these sessions.</p>	
11.00 – 12.30 pm Choose either session.	CLASSROOM SESSIONS 3
	<p>M5 Bar Models for Elementary Grades</p> <p>This session introduces the use of bar models to solve word problems. We will be solving word problems while learning the basic models used at elementary level. We will see the use of bar diagrams to model part-whole, change and comparison situations and also learn a few advanced techniques such as the cutting and shifting the bars.</p> <p>R6 Learn Some Math with Dr. Richard Bisk – Challenging Problem Solving</p> <p>We will be solving a set of challenging problems using bar modeling and other strategies.</p>
12.30 – 2.00 pm	Lunch
<p>The following sessions will provide a deeper understanding of fractions and the teaching of fractions.</p>	
2.00 – 3.30 pm Choose either session.	CLASSROOM SESSIONS 4
	<p>B7 Teaching Fractions Across Levels</p> <p>An overview of the progression of fraction arithmetic will be presented from Grade 2 to Grade 5, taking into account the children’s increasing skills with whole number arithmetic, mathematical properties, and number theory.</p> <p>B8 Teaching Fundamental Concepts in Fractions</p> <p>Learn how to teach core fundamental concepts such as the concept of equal parts, equivalent fractions and mixed numbers. See how a problem-solving approach can be used to teach basic concepts in an engaging way.</p>

8 JULY 2011	SESSION
8.30 – 10.30 am	Plenary Session 3
	<p><i>Pedagogical Strand: Helping the Average and Low-achieving Students Learn Mathematics</i></p> <p><i>Content Strand: Fractions</i></p>
<p>The plenary session provides a holistic view of fractions as well as an understanding of the pedagogy that allows average and struggling learners learn mathematics well. The classroom sessions extend the learning of teaching of fractions to include multiplication and division involving fractions.</p>	
11.00 – 12.30 pm Choose either session.	CLASSROOM SESSION 5
	<p>B20 Teaching Fractions Multiplication and Division</p> <p>Learn how multiplication and division of fractions is taught in the upper grades. See how the meanings of the operations developed in earlier grades are used to extend students' understanding.</p> <p>B21 Teaching Fractions Using Visuals</p> <p>Visuals are central to learning mathematics. We will see how visuals can be used to introduce skills such as writing equivalent fractions, converting mixed numbers to improper fractions, and the basic operations.</p>
12.30 – 2.00 pm	Lunch
<p>The concluding classroom sessions provide options. A session to link fractions to other topics is available. You may want to wrap up your learning by reviewing the bar model method in problems that are more challenging or which involve fractions. Alternatively, you can learn about mental computation strategies to review the teaching of basic operations or do an elective on geometrical thinking.</p>	
2.00 – 3.30 pm Choose either session.	R24 Learn Some Math with Dr. Richard Bisk – Mental Computations
	<p>We will learn some mental computation strategies and see their roles reinforcing and understanding of placement value and other mathematical concepts.</p> <p>B27 Bar Models for Fraction Problems</p> <p>Learn the core skills in model drawing through a series of fraction problems – from the basic to challenging. Learn a couple of advanced skills such as 'cutting' and 'shifting' the bars.</p>

About the Speakers

DR. YEAP BAN HAR is the Principal of Marshall Cavendish Institute. He is an established name in teacher professional development, having presented keynote lectures at international conferences and written for academic publications. He has also been invited to give seminars at various universities around the world. An experienced educator, Ban Har spent ten years at the National Institute of Education, Singapore, where he taught a range of teacher education courses and was involved in several funded research in mathematics education. He continues to teach courses at tertiary institutions such as the National Institute of Education (Singapore), Wheelock College (Boston) and Rajabhat Maha Sarakham University (Thailand) in adjunct positions. Ban Har also sits on the advisory board of SEED Institute and several schools in Singapore and Asia. Ban Har holds Master of Arts in Southeast Asian Studies, Master of Education and Ph.D. in mathematics education.

DR. RICHARD BISK is professor and chair of the Mathematics Department at Worcester State University. He received a Ph.D. in Mathematics from Clark University in 1984. For over thirty years, he has taught a wide array of Mathematics courses ranging from remedial math to calculus, linear algebra, mathematical modeling and number theory. Dr. Bisk has worked extensively with K-12 teachers and their students over the past twenty years. He has taught numerous preservice and inservice courses that focus on improving the mathematical understanding of teachers. Many of these courses make extensive use of Primary Mathematics textbooks from Singapore. Dr. Bisk was recently part of a successful effort to substantially raise the mathematical requirements for new elementary teachers in Massachusetts. He has served as Co-Chair of the Massachusetts Department of Education Mathematics and Science Advisory Council and has been a member of their Mathematics and Science Partnerships Steering Committee and of the Massachusetts Board of Higher Education Admissions Advisory Committee. Dr. Bisk is a consulting author for the Math In Focus textbook series, a U.S. adaptation of books from Singapore. He has given presentations at local, national and international conferences on his work with the mathematics curriculum from Singapore.

MS PEGGY FOO is a lecturer at Marshall Cavendish Institute. In the last three years, she specialized in teachers' professional development in the Training and Development Division of Ministry of Education, Singapore. She has conducted workshops for inservice teachers on professional development tools and rendered consultancy services to help schools align staff development plans to their strategic goals. As a former primary school teacher, she was part of a team which developed a programme for lower primary pupils called Strategies for Effective and Engaged Development (SEED) which seeks to better engage young learners through hands-on activities and experiential learning. She has also designed interdisciplinary project packages that facilitate students' collaborative learning and is a research activist for the use of Learning Circles as a PD tool to help teachers examine their teaching practices collaboratively, thereby improving students' learning outcomes and the school's learning culture.

Everything Else You Need to Know

Venue

The inaugural Singapore Mathematics Summer Institute from 6-8 July 2011 will be held at Worcester State University, Massachusetts.

Worcester State University is located in Worcester, Massachusetts, which is located approximately 40 miles west of Boston. Worcester State University is located at: **486 Chandler Street, Worcester, Massachusetts 01602.**

The campus is accessible by various modes of transportation. You can find additional information on how to get there at www.worcester.edu/directions.

Accommodation

Accommodation is available at the residence halls within Worcester State University. Additional information on accommodation will be provided upon request. Alternatively, there are also various hotels and motels located near the university.

Enquiries

For more information, please email melissaooi@sg.marshallcavendish.com.