

Skills development – The Singapore Experience

How does MoE respond to global changes?

Vision of the Ministry of Education: **Moulding the future of the nation**

- **Thinking Schools, Learning Nation**: Introduced in 1997 to focus on explicit teaching of thinking through school subjects.
- **Innovation and Enterprise**: Initiative introduced in 2003 to focus on inculcating good habits of minds amongst students.
- **Teach Less, Learn More**: Call made in 2004 to encourage development of strong foundation of knowledge.
- **Nurturing Every Child**: Call made in 2005 every child should be developed to maximize their potential using varied approaches. Teachers encouraged to use variety of teaching strategies to connect with differentiated learners

WORLD CLASS EDUCATION



Singapore Tops International Studies

Progress in International Reading Literacy Study.

- (PIRLS) Once every 5 years.
- 2006 ranked 2nd (English).
- Best improvement from 2001 to 2006.

Trends in International Math and Science Study.

- (TIMSS) Once every 4 years.
- Consistently ranked top 3 since 1995.

Programme for International Student Assessment

- (PISA) Once every 3 years.
- 2009 ranked 5th Reading, 2nd Math, 4th Science.

TIMSS Math 2007 (Selected Countries)

- Grade 8
- % of students reaching international benchmark.

	Colombia	Jordan	Sweden	United States	Singapore	Taiwan
Advance	0	1	2	6	40	45
High	2	11	20	31	70	71
Intermediate	11	35	60	67	88	86
Low	39	74	90	92	97	95

Correlation in cohort performance

54

Exhibit 1.4

Cohort Comparison: 2003 Fourth Grade Students in Eighth Grade in 2007

TIMSS 2007 Science 4th & 8th Grades

Country	Difference From TIMSS Scale Avg.	
Singapore	65 (5.5)	○
Chinese Taipei	57 (2.0)	○
Japan	43 (1.5)	○
Hong Kong SAR	42 (3.1)	○
England	40 (3.6)	○
United States	36 (2.5)	○
Hungary	30 (3.0)	○
Russian Federation	26 (5.2)	○
Australia	21 (4.2)	○
Italy	16 (3.8)	○
Lithuania	12 (2.6)	○
Scotland	2 (2.9)	○
Slovenia	-10 (2.5)	⊖
Norway	-34 (2.6)	⊖
Armenia	-63 (4.3)	⊖
Iran, Islamic Rep. of	-86 (4.1)	⊖
Tunisia	-186 (5.7)	⊖
TIMSS Scale Avg.	500	
Benchmarking Participants		
Ontario, Canada	40 (3.7)	○
Quebec, Canada	0 (2.5)	○

Country	Difference From TIMSS Scale Avg.	
Singapore	87 (4.1)	○
Chinese Taipei	57 (2.0)	○
Hong Kong SAR	54 (3.5)	○
Japan	48 (2.1)	○
Russian Federation	46 (4.8)	○
England	42 (2.9)	○
United States	39 (2.7)	○
Hungary	36 (3.3)	○
Italy	35 (3.2)	○
Australia	27 (3.3)	○
Slovenia	18 (1.9)	○
Lithuania	14 (2.4)	○
Scotland	0 (2.3)	○
Armenia	-16 (5.7)	⊖
Norway	-23 (3.5)	⊖
Iran, Islamic Rep. of	-64 (4.3)	⊖
Tunisia	-182 (5.9)	⊖
TIMSS Scale Avg.	500	
Benchmarking Participants		
Ontario, Canada	36 (3.7)	○
Quebec, Canada	17 (2.7)	○

Country	Difference From TIMSS Scale Avg.	
Singapore	78 (4.3)	○
Chinese Taipei	71 (3.5)	○
Hong Kong SAR	56 (3.0)	○
Japan	52 (1.7)	○
England	44 (4.1)	○
Hungary	43 (2.8)	○
United States	27 (3.1)	○
Australia	27 (3.8)	○
Slovenia	20 (1.8)	○
Lithuania	19 (2.1)	○
Russian Federation	14 (3.7)	○
Scotland	12 (3.4)	○
Norway	-6 (2.2)	⊖
Italy	-9 (3.1)	⊖
Armenia	-39 (3.5)	⊖

Country	Difference From TIMSS Scale Avg.	
Singapore	67 (4.4)	○
Chinese Taipei	54 (1.9)	○
Japan	42 (4.5)	○
England	39 (2.9)	○
Hungary	38 (2.2)	○
Hong Kong SAR	30 (4.9)	○
Russian Federation	30 (3.9)	○
United States	20 (2.9)	○
Lithuania	19 (2.5)	○
Australia	15 (3.6)	○
Scotland	-4 (3.4)	○
Italy	-5 (2.8)	⊖
Armenia	-12 (5.8)	⊖
Norway	-13 (2.2)	⊖

SOURCE: IEA Trends in International Mathematics and Science Study (TIMSS) 2007

Primary Science framework & curriculum provide a strong foundation in learning more complex Science concepts

HOW DO WE DO IT?



How Does Singapore Do It?

Three cornerstones of education:

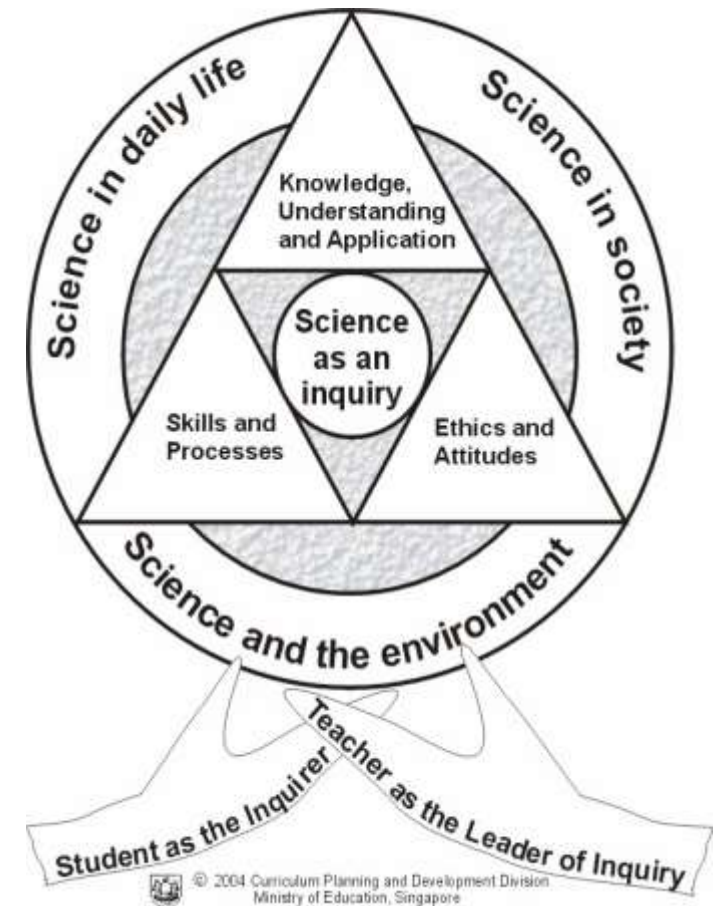
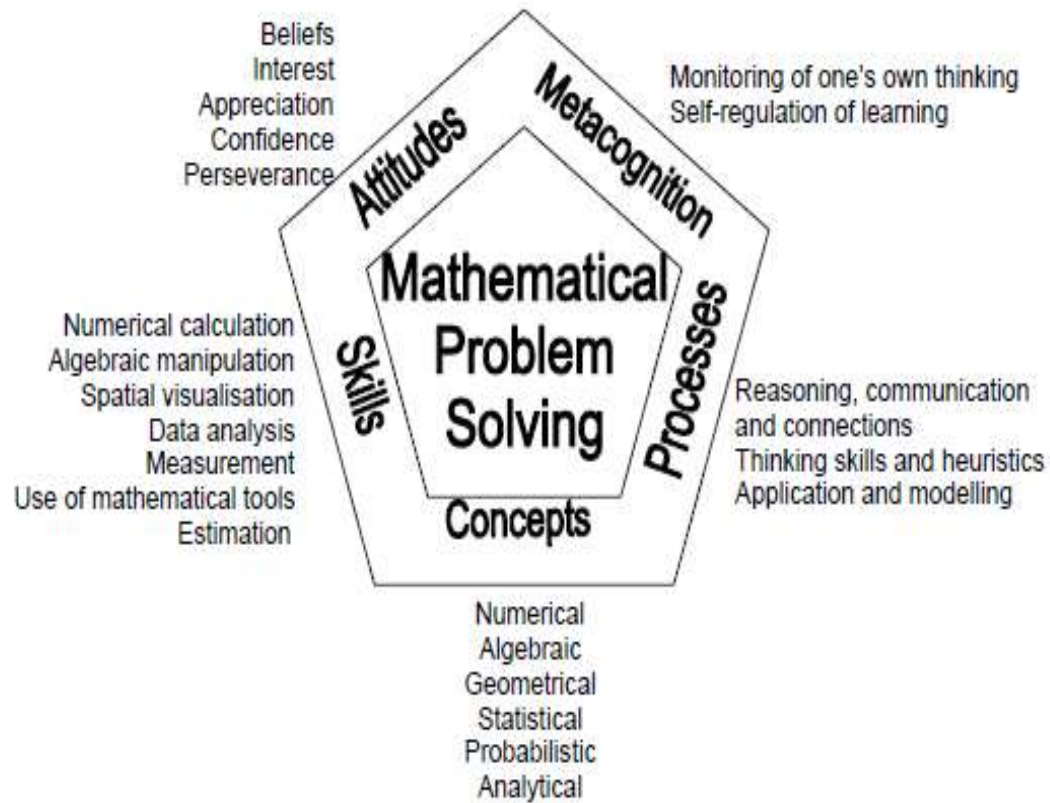
- English as the language for communication.
- Math to develop intellectual competence.
- Science to nurture curiosity to explore things.

Curriculums emphasize on:

- Problem solving, critical thinking and inquiry.
- Not formulae, procedures and computations.
- Confidence to communicate effectively

How Does Singapore Do It?

Focus on the teaching and development of essential skills, attitudes, knowledge and understanding which are important building blocks in developing a thinking nation.



Source: The Singapore Mathematics & Science Curriculum by the Ministry of Education Singapore.

Singapore's world class education:

- Strong curriculum.
- Well-equipped schools (facilities and technology).
- Competent teachers.

Content Development for Singapore English

Integrated approach to teaching & learning of reading, writing, speaking and listening

- to develop thinking skills
- Curriculum focuses on text types (genre)
- to equip students with essential skills for a knowledge-base economy

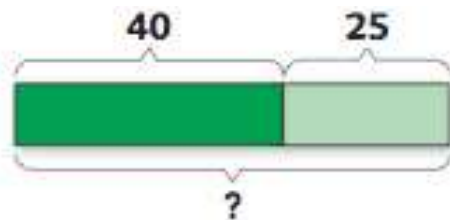


Content Development for Singapore Math

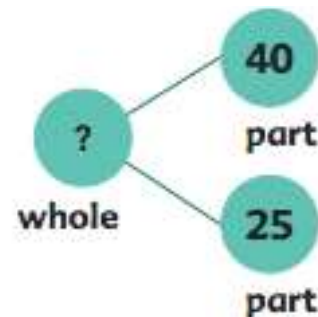
- Concrete → Pictorial → Abstract approach to understand concepts.



- Model Method to visualise, see connections, solve problems.



To find the whole, we add.



Bar Modeling as a Problem Solving Tool

- Mrs Brown baked some cakes. She sold $\frac{3}{4}$ of the cakes and gave $\frac{1}{2}$ of the remaining cakes to her neighbours. She is left with 6 cakes. How many cakes did Mrs Brown bake?

No. of cakes = y

No. of cakes sold = $\frac{3}{4}y$

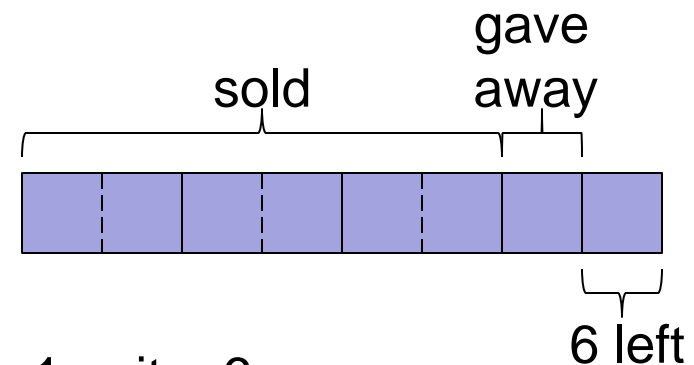
No. of cakes left =

$$\frac{1}{4}y \times \frac{1}{2} = 6$$

$$\frac{1}{8}y = 6$$

$$y = 48$$

Mrs Brown baked 48 cakes.



$$1 \text{ unit} = 6$$

$$8 \text{ units} = 6 \times 8 = 48$$

Mrs Brown baked 48 cakes.

Watching Math class in action

Content Development for Singapore Science

- Inquiry based with learning centered around students' questions.

Engagement – setting the stage for learning

Exploration – developing concepts through hands-on activities


Explanation – communicating and checking understanding

Elaboration – Applying concepts in context and extending understanding

Evaluation – Summing up meaningfully

Content Development for Singapore Science

- Building a strong foundation
 - As students progress from grade to grade, their foundation of scientific knowledge is continuously reinforced through a spiral curriculum.

	Grades 1	Grades 2	Grades 3	Grades 4	Grades 5	Grades 6
Topic						
Skills	<ul style="list-style-type: none"> • Observe • Compare • Classify • Communicate • Infer • Predict 		<ul style="list-style-type: none"> • Observe • Compare • Classify • Communicate • Infer • Predict • Use apparatus and equipment • Analyse • Generate possibilities • Evaluate 		<ul style="list-style-type: none"> • Observe • Compare • Classify • Communicate • Infer • Predict • Use apparatus and equipment • Analyse • Generate possibilities • Evaluate • Formulate a hypothesis • Solve a problem creatively • Make a decision • Investigate 	

Content Development for Singapore Science

Grades 1-2

- Observe
- Compare
- Classify
- Communicate
- Infer
- Predict

Grades 3-4

- Observe
- Compare
- Classify
- Communicate
- Infer
- Predict
- Use apparatus and equipment
- Analyse
- Generate possibilities
- Evaluate

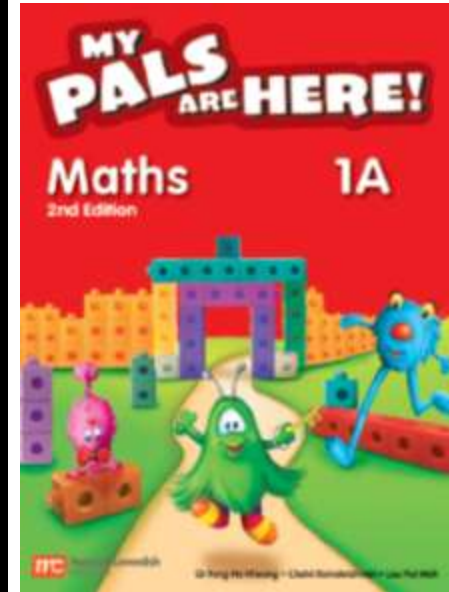
Grades 5-6

- Observe
- Compare
- Classify
- Communicate
- Infer
- Predict
- Use apparatus and equipment
- Analyse
- Generate possibilities
- Evaluate
- Formulate hypothesis
- Solve a problem creatively
- Make a decision
- Investigate

Watching Science class in action

Highlights – S Africa

- Pilot in S Africa started in 2008.
- 12 public schools chosen (6 adopt SM & 6 adopt SAM curriculum:
 - SM pupils learn concept in 4.26 months against norm of 7 months.
 - SM pupils now enjoy learning Math
 - SM teachers now confident teaching
 - Pilot expanded to 80 schools.



Legend:

SGP Math (SM)

SA Math (SAM)

Singapore Math in S Africa

THANK YOU